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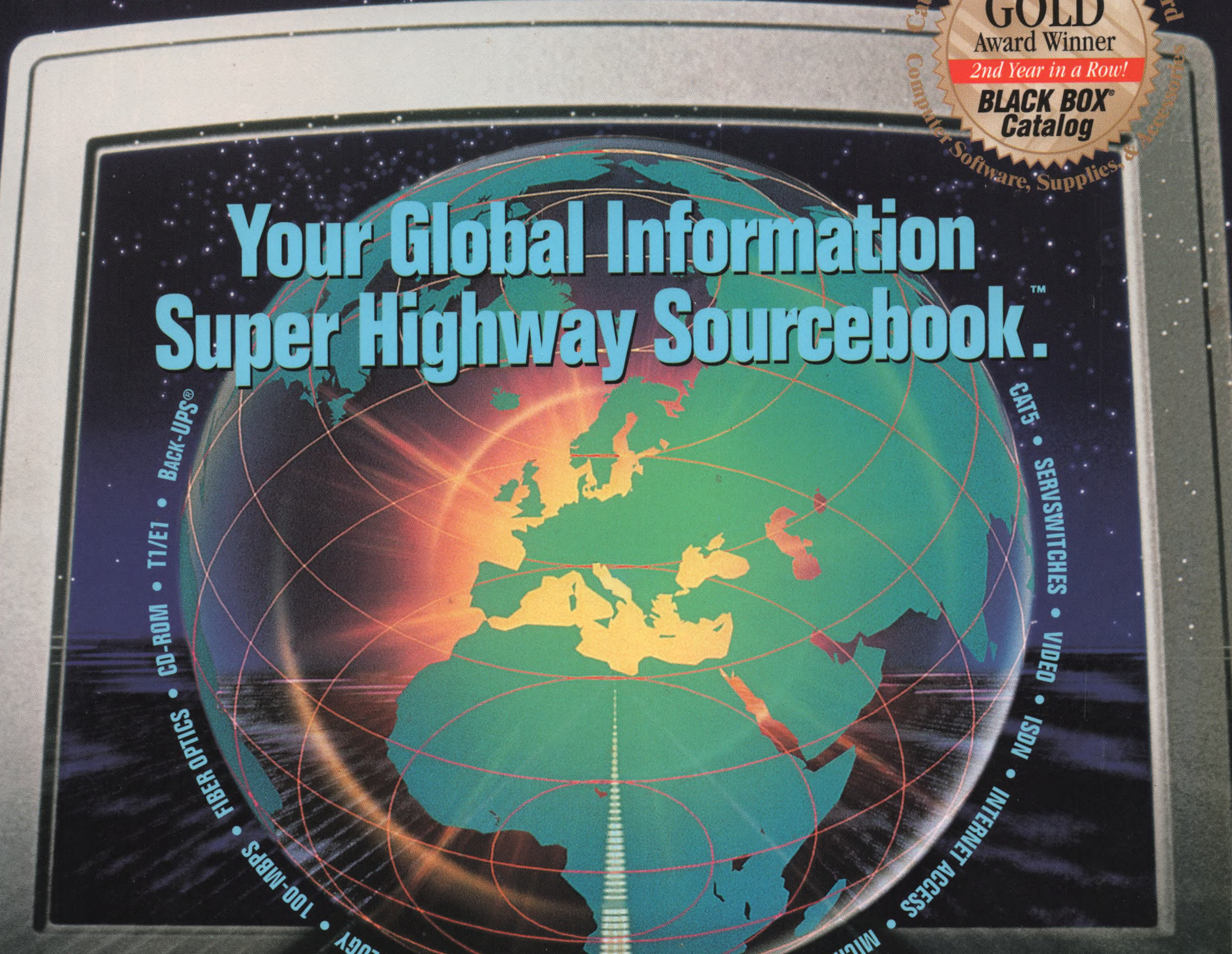
Computer Software, Supplies, & Accessories



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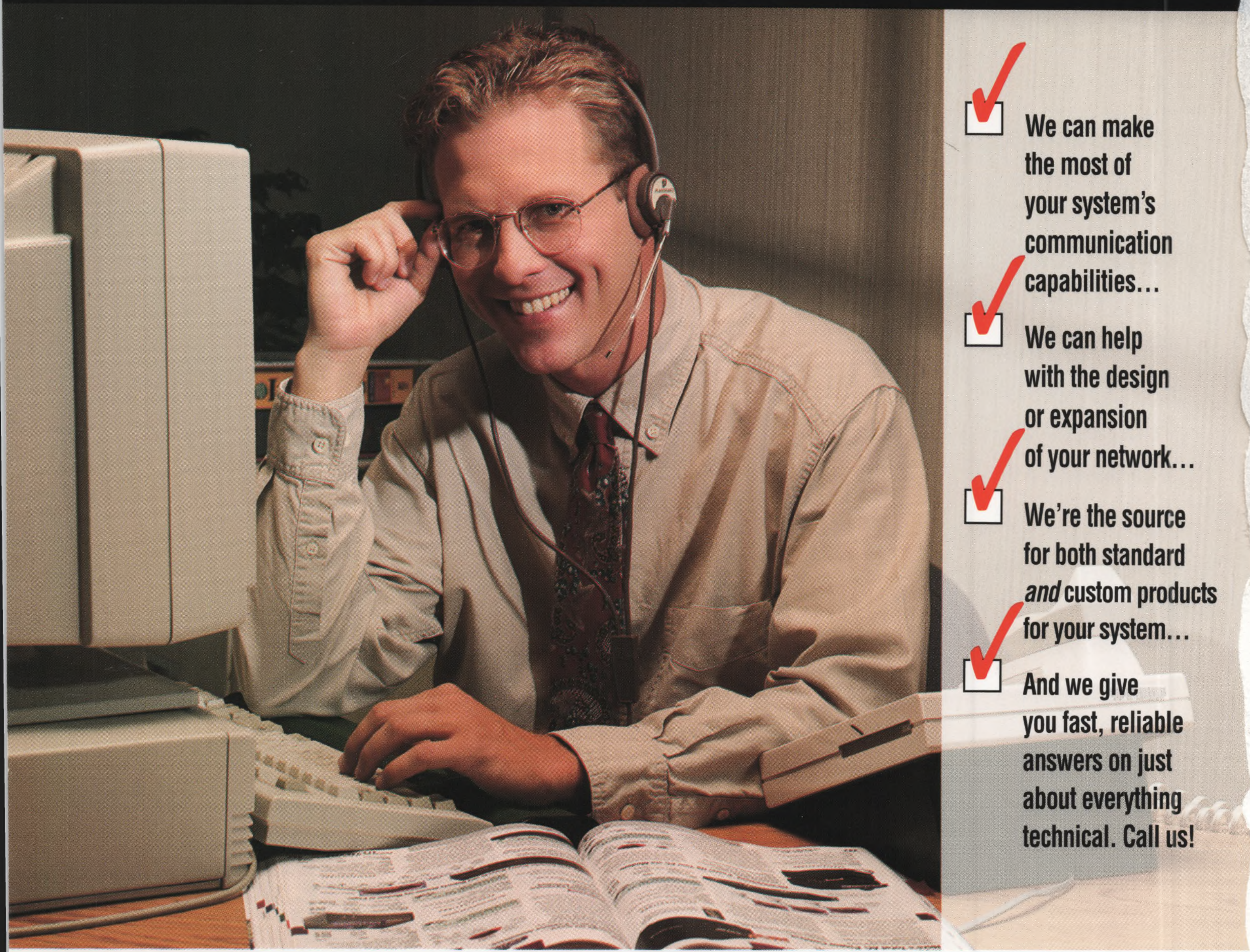

- ☑ We can make the most of your system's communication capabilities…
- ☑ We can help with the design or expansion of your network…
- ☑ We're the source for both standard *and* custom products for your system…
- ☑ And we give you fast, reliable answers on just about everything technical. Call us!

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PRESS 1,2,1 CONVERSION	PRESS 1,2,2 CONNECTIVITY	PRESS 1,2,3 COMMUNICATIONS	PRESS 1,2,4 LOCAL AREA NETWORK
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Still unsure which group you need? Want more information? Then press 1,2,2 for the Connectivity Group and they'll route your call appropriately.

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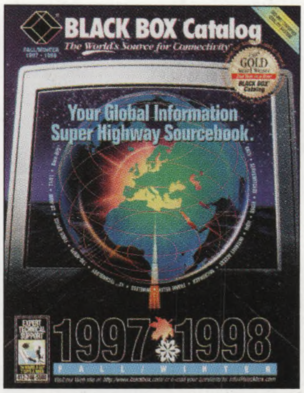
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Dear Valued Customer:

Welcome to Black Box's 1997–1998 Fall/Winter Catalog!

At **654** pages, this is our biggest Catalog yet! We have the hot new products you're looking for plus other great offerings! Because you're a Valued Customer, you can buy the newest products—and nearly all Black Box products—at lower prices! Even if your company has a volume-purchase agreement, you may qualify for even greater discounts under our Large Single-Order Discount Program!

For example, a $20,000 order is 30% off—that's a savings of $6000! Black Box can almost always offer you these discount prices, although some special orders or certain products may not be eligible. The following is the Schedule for our Large Single-Order Discount Program:

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$5000–9999	**15%**
$10,000–14,999	**20%**
$15,000–19,999	**25%**
$20,000–24,999	**30%**
$25,000–39,999	**35%**
$40,000–69,999	**40%**
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For help with your computer communications and networking needs, call us today at **412-746-5500**. And don't forget our expert Technical Support—it's free!

Sincerely,

Jeffery M. Boetticher
Chairman & Chief Executive Officer

Thank You for Your Business!

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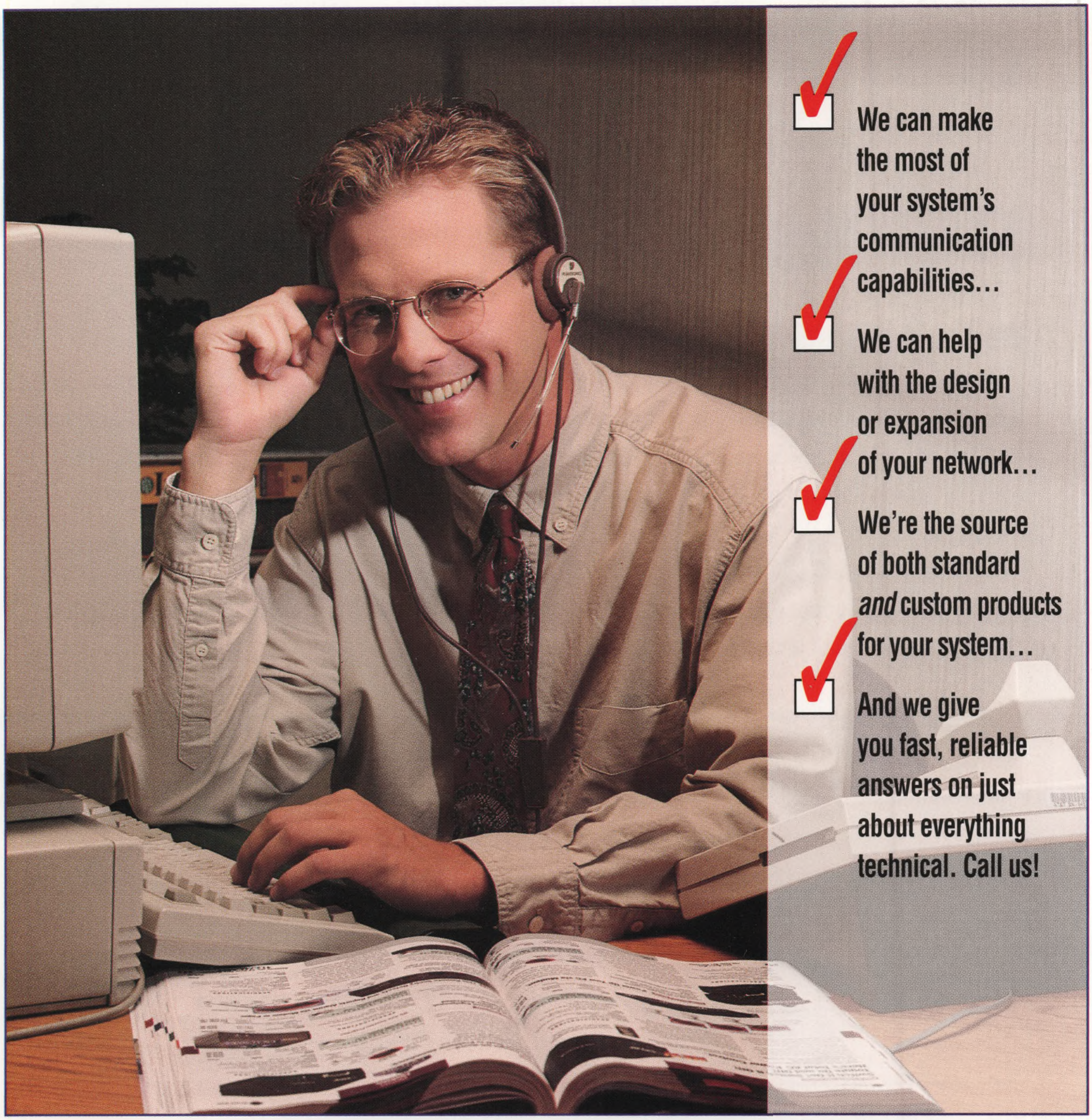

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☑ We can help with the design or expansion of your network...

☑ We're the source of both standard *and* custom products for your system...

☑ And we give you fast, reliable answers on just about everything technical. Call us!

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Interface Converters, Twinax/UTP & Baluns, Protocol Converters, SCSI, Bar Code	Printer Devices, Cables/Connectors, Switches, Tools/Racks, Equipment Protection/Testers	Modems, CSU/DSUs, ISDN, T1, X.25/Frame Relay, Muxes/Line Sharing, Line Drivers, Video & Multimedia, PC Communications/Accessories	High-Speed, Bridges and Routers, Remote Access, Wireless, Network Management, Ethernet, Token Ring, NetWare®, AppleTalk®, ARCNET®, CD-ROM

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One phone call...The right solutions...
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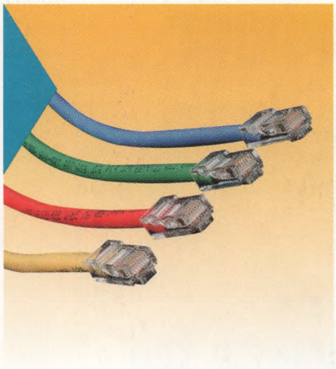

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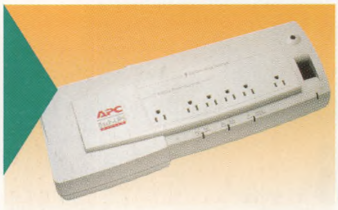

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PLUS! If You Don't See What You Need in This Catalog, **Call Us: 412-746-5500!**

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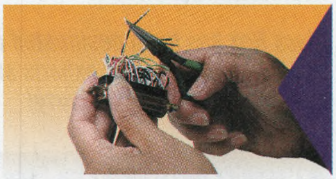

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EXPERT TECHNICAL SUPPORT
24 HOURS A DAY 7 DAYS A WEEK

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- Advanced Multimedia Outlets • More PC Cards • Sportster ISDN
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- APC® Power Protection
- Bay Autosense Switch
- Belden Cables
- Cisco Routers
- Intel® Hubs
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Black Box has been designated a Cisco Premier Reseller. Our Technical Support experts are certified by Cisco to support every Cisco product we carry!

Technical Education.

Guide to Print Sharing
New
Guide to Premise Cabling
Updated!

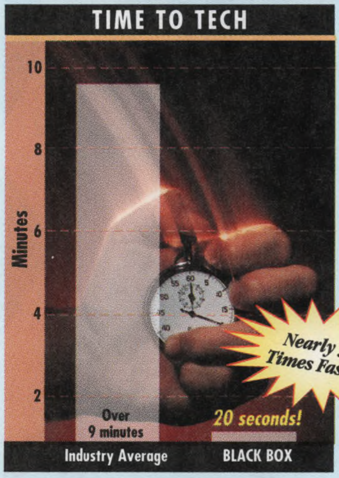
The BLACK BOX® Guide to Print Sharing
(AA880, $14.95) Connect network users, boost productivity, save money! Worksheet included.

The BLACK BOX® Guide to Premise Cabling
(AA810-R, $24.95) A complete EIA/TIA 568-compliant premise wiring system, certified and trouble-free. Worksheets included.

Coming Soon! *New*

The BLACK BOX® Guide to Local and Remote Communications
Which equipment is right for your local or remote communications? Do you go analog or digital? Find out here!

Premier Technical Support.



Black Box's Technical Support experts provide support for 100% of our Catalog products—and our Techs are here to help you *24 hours a day, 7 days a week*. Your calls are answered by a Tech within 20 seconds, and most problems are solved within 20 minutes! Best of all, it's FREE!

New VIPreviews.

Reserved for our special customers who want more of the best—our **FREE** VIPreviews. Receive *Updates* to the Catalog **plus** product-application features! Recent VIPreviews spotlighted:

- **3Com® Small Office**
- **Power & Data Protection**
- **U.S. Robotics®**
- **Routers**

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- **High-Speed**
- **CAT5 and Beyond**

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Internet
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The Big Book Wins—Again!

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Black *Gold*.

The *BLACK BOX® Catalog* wins big with customers—and *Catalog Age*—again! For the second year in a row, The Big Book takes the Gold!

Informative copy with crisp photos and layout bring in the customers. Plus, we offer product guarantees, helpful service, and Technical Support expertise to keep customers coming back. Presentation and service—that's what it takes to win the Gold Award.

Powerful Paks.

Three new ways to make shopping easier—so you save even more time and money!

CONVENIENCE SMART PAK BUY IN BULK & SAVE!

Bulk Savings. Larger-quantity packages for convenience and savings. Choose the number of connectors, plugs, or pins to fit your needs for today *and* tomorrow.

PRODUCTIVITY SOLUTION PAK NEW WAYS TO WORK!

Unique Applications. We pair up products so you don't have to shop around. Everything you need in one place—at Black Box, we sell solutions not just products.

CERTIFIED READY PAK ALL CABLES INCLUDED!

Connect the Right Way Right Away. We've included the exact cables you need with our most popular products. BLACK BOX® Cables are tested 100% so you make the best connnections—always!

Product-Reference Pullout Charts.

- **Bulk Cable**
  Which bulk cable do you need? This handy chart shows you.
- **ServSwitch**
  ServSwitches save! Find out which one's right for your application.

Product-Selection Guides.

We've expanded some of our most popular product lines—and we've made shopping *easier* with our product-selection guides and their color-coded keys (see **above**). Turn to the pages **below** and find out more!

- **ServSwitch™ Technology** (pp. 270–287)
- **High-Speed Switches** (pp. 476–487)
- **U.S. Robotics Technology** (pp. 394–397)
- **Router Technology** (pp. 500–507)

Improved Packaging.

Call Us, We Have It—412-746-5500!

As soon as you place your order, Black Box's new Distribution Center kicks into action.

Every product we ship comes with new distinctive packaging, as seen on the **right**.

So, if your business receives several packages a day, you'll definitely know which one has your quality Black Box product!

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Buy with Confidence... BLACK BOX!
The Greatest Selection of Computer Communications and Networking Solutions Anywhere on Earth!
You Know It's Black Box!

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24 hours a day, 7 days a week!

***And NOW*—ORDERING & CUSTOMER SERVICE:**

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7 A.M. Monday–Midnight Friday ET
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***Plus*—SAME-DAY SHIPPING:**
Order before midnight and we'll ship same day!

What's so SPECIAL about

Here's what some of our

Our Catalog

Your Catalog is very descriptive and easy to use. You're doing a great job!
—T.E., Account Coordinator

Our Technical Support

TECH SUPPORT
OUR BEST PRODUCT!

Your 24-hour technical support is almost too good to be true.
—T.N., Small Business Owner

Your technical support is great! Every time I've called, you've pointed me in the right direction and solved my problem.—C.E., Systems Administrator

Our Customer Sales and Service

I've always received prompt responses when requesting quotes. Your staff is always courteous and helpful!—J.K., Project Coordinator

Our Same-Day Shipping

You had the exact product I needed and had it to me overnight.
—L.B., Electrician

Thanks for a Few Minutes of Your Time!

◆ Why did you choose Black Box for your purchase?

____

◆ How did you become familiar with Black Box?

____

◆ What can we do to serve you better?

____

Our 45-Day Money-Back Guarantee

Backing up your entire product line with money-back guarantees is the ultimate in no-risk shopping.—G.C., Network Controller

BLACK BOX?

customers have to say about...

Our Variety of Products

*No other company had the items we needed—
or even knew what they were.*—W.F., Draftsman

I couldn't locate what I needed in four stores. Finally, a salesperson recommended your Catalog and I found what I wanted.—C.S., Office Manager

Our Custom Products

*This is one of the only companies I know
that will make the product I need.*—J.G., Physician

Our Mailing Lists

Your policy of not selling mailing lists is exemplary.
—T.T., Communications Administrator

Our Competitive Prices

*We chose Black Box because you had the merchandise
we needed at a very reasonable price.*—R.S., Librarian

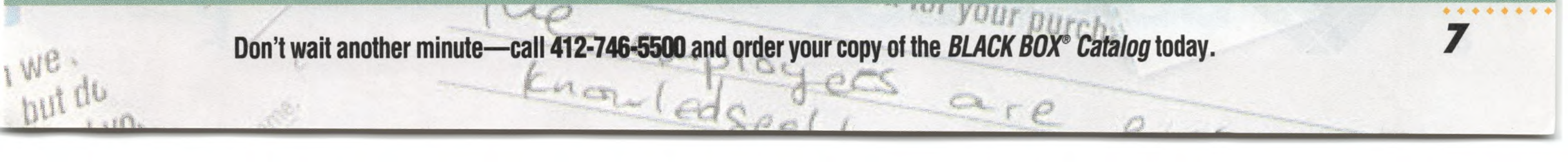
Having worked for one of your competitors, I can attest to your low prices and wide selection. Keep up the good work!—P.R., Contract PC/LAN Technician

Our Reference Materials

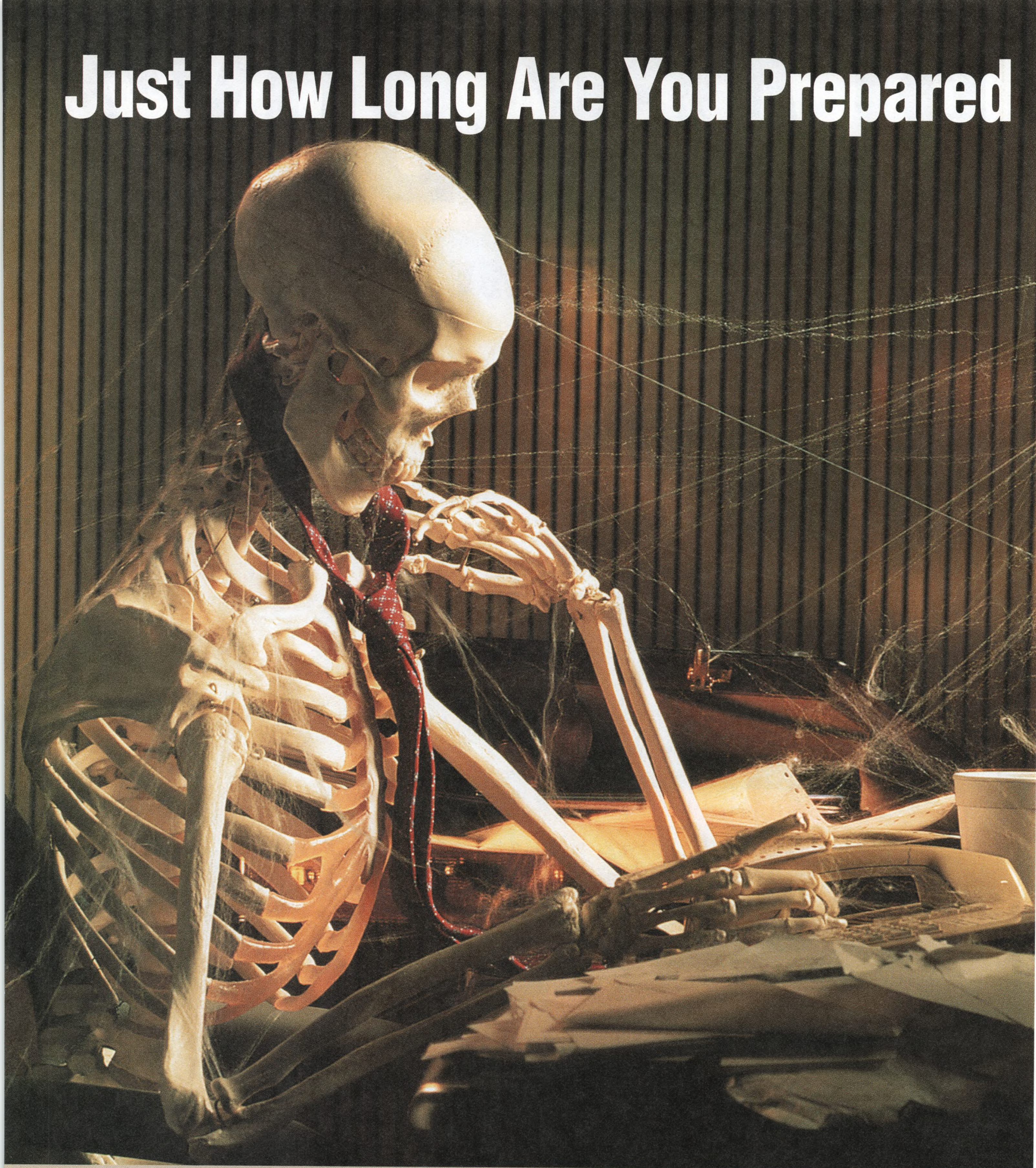
Your FaxBack service is a valuable resource for finding current information on today's new technologies.—B.K., Electrical Designer

Your Catalog is an excellent reference tool. The technical section is great!
—P.S., Technical Trainer

Your Pocket Glossary and product-application drawings have been very helpful in understanding my own job.—R.R., Systems Engineer



Just How Long Are You Prepared



to Wait for Technical Support?

At Black Box, We Think 20 Seconds Is Long Enough *for the Best!*

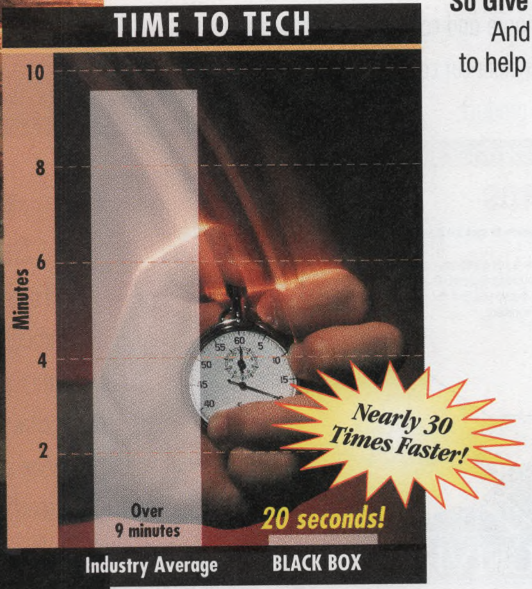
Industry surveys show 90% of system managers are desperate for reliable technical support. Here's why 1.2 million customers worldwide trust Black Box for accurate, up-to-date computer communications and networking solutions.

Record-Setting Service.
Faster than the Internet! Your call is answered in three to five rings by a qualified technical expert.

Assistance Anytime.
Call 24 hours a day, 7 days a week. More than 100 technical service representatives stand ready to help.

Easy-to-Understand Answers.
Plain talk you can follow regardless of your level of knowledge. No "techno speak" unless you want it.

FREE Advice.
That's right, support that costs you nothing. No contract. No limits. No obligation. No catch.



So Give Us a Call…
And have your stopwatch ready. Our Experts are waiting to help you.

Call Black Box *Today*
for ***FREE*** Technical Support!

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The World's Source for Connectivity℠

Fully Authorized Support for the Brand Names You Demand!

3Com	APC American Power Conversion	Bay Networks	Belden	Cisco Systems	intel	USRobotics The Intelligent Choice in Information Access
98 Best Sellers!	*68 Hot Solutions!*	*Nearly 200 Innovations!*	*69 Great Cabling Ideas!*	*More than 100 Items!*	*Over 50 Top Products!*	*41 Popular Solutions!*

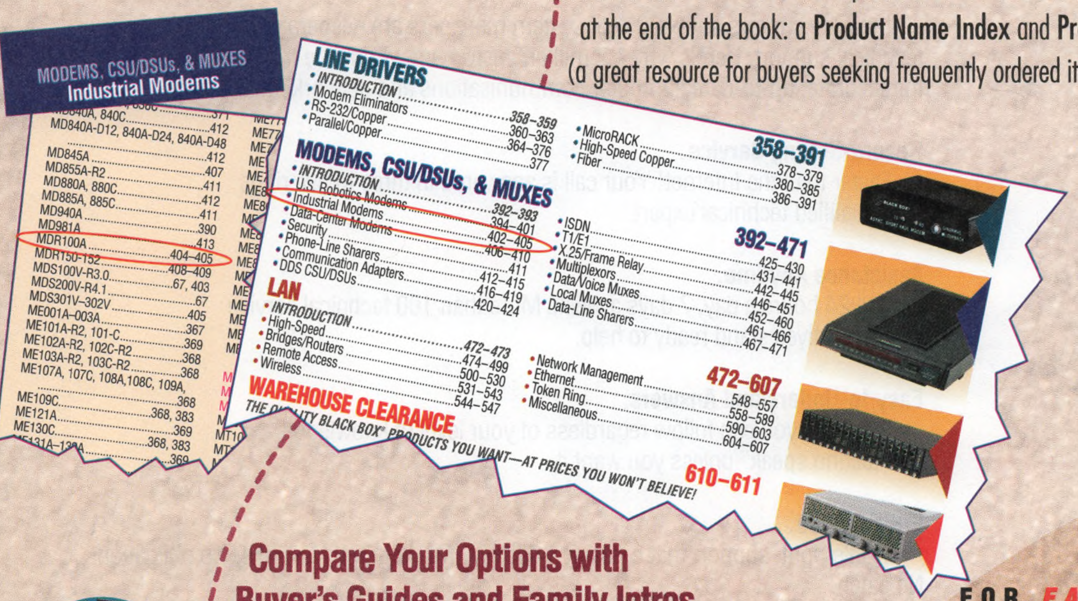
It's Easy to Find Your Way

No Matter *What* You're Looking For.

Take Modems for Instance...

Start with the Table of Contents and Comprehensive Indexes.

You'll find the product families in the **Table of Contents** (see **pages 2–3**). Then narrow your search even further by subsection. **Color Tabs** simplify navigation and detailed **Mini-Indexes** introduce each product section. We even include two comprehensive indexes at the end of the book: a **Product Name Index** and **Product Code Index** (a great resource for buyers seeking frequently ordered items).



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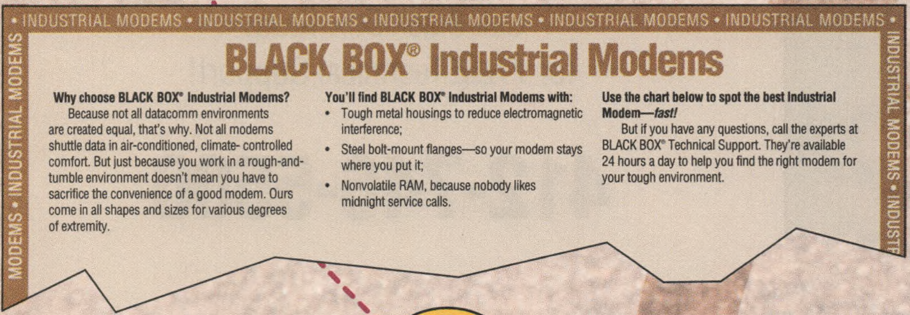
THE QUALITY BLACK BOX® PRODUCTS YOU WANT—AT PRICES YOU WON'T BELIEVE!

Compare Your Options with Buyer's Guides and Family Intros.

Trying to decide which hub, modem, or cable is best for you? Compare! Our new **Family Intros** (**below**) will help you compare and contrast related items. Then look for the **Buyer's Guide** symbol for clear-cut comparisons of the benefits *and savings* you'll receive with each product.



• INDUSTRIAL MODEMS • INDUSTRIAL MODEMS • INDUSTRIAL MODEMS • INDUSTRIAL MODEMS • INDUSTRIAL MODEMS •

BLACK BOX® Industrial Modems

Why choose BLACK BOX® Industrial Modems?
Because not all datacomm environments are created equal, that's why. Not all modems shuttle data in air-conditioned, climate- controlled comfort. But just because you work in a rough-and-tumble environment doesn't mean you have to sacrifice the convenience of a good modem. Ours come in all shapes and sizes for various degrees of extremity.

You'll find BLACK BOX® Industrial Modems with:

- Tough metal housings to reduce electromagnetic interference;
- Steel bolt-mount flanges—so your modem stays where you put it;
- Nonvolatile RAM, because nobody likes midnight service calls.

Use the chart below to spot the best Industrial Modem—*fast!*
But if you have any questions, call the experts at BLACK BOX® Technical Support. They're available 24 hours a day to help you find the right modem for your tough environment.

What's Hot, New, or One-of-a-Kind?

Just look for our eye-catching symbols. You'll spot the latest cutting-edge solutions—like **Hot New Products**, our **Technicians' Products of Choice**, and **Black Box Exclusives**—only at Black Box.

FOR *FAST* TECH SUPPORT,
Call **412-746-5500**,

PRESS **1,2,3** COMMUNICATIONS

Modems, CSU/DSUs, ISDN, T1, X.25/Frame Relay, Muxes/Line Sharing, Line Drivers, Video & Multimedia, PC Communications/Accessories

The Fastest Technical Support!

Forget about wading through automated instructions to reach our **Technical Experts.** These phone charts show you the shortcuts to reach the right expert *fast!* In fact, you'll be live with our Techs in just two or three rings!

around The Big Book!

Black Box Explains...

V.34 Modulation.

The ability to sense line conditions and shift resources intelligently for maximum efficiency—that's V.34 modulation. And it's what distinguishes this new standard from all dialup modem standards.

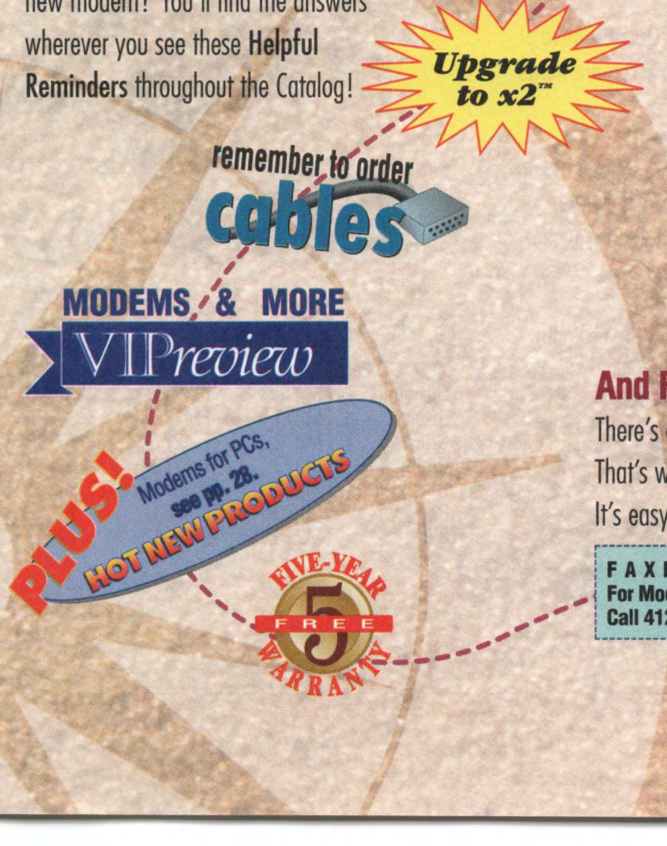
By constantly assessing line conditions and implementing various combinations of 10 new signal modulation techniques, V.34

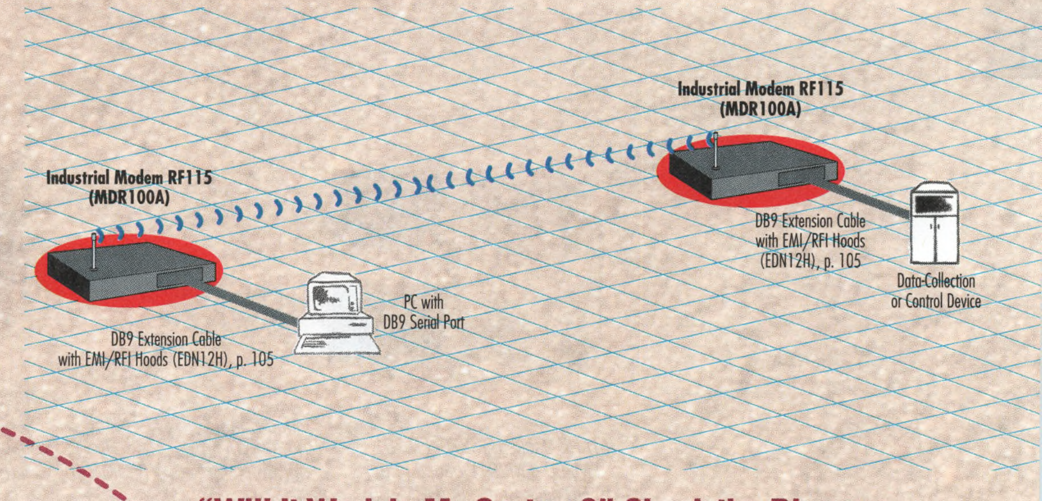
30-Second Tutorials.

Count on our **Black Box Explains** sidebar tutorials for simple explanations of technical concepts, terms, and jargon. You'll get the information you need to make informed choices for your system.

Helpful Reminders!

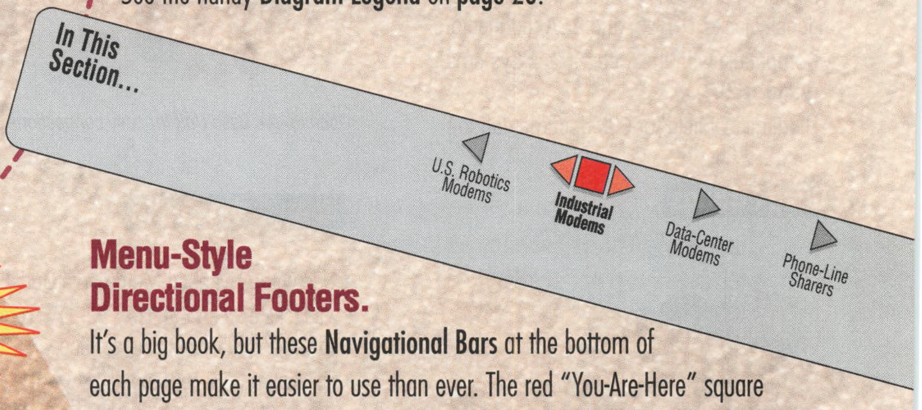
Need a special cable? Looking for a similar product? Wondering what kind of a warranty comes with that new modem? You'll find the answers wherever you see these **Helpful Reminders** throughout the Catalog!


Upgrade to x2™
remember to order
cables
MODEMS & MORE
VIPreview
PLUS!
Modems for PCs, see pp. 28.
HOT NEW PRODUCTS
FIVE-YEAR
5
FREE
WARRANTY


Industrial Modem RF115
(MDR100A)
Industrial Modem RF115
(MDR100A)
DB9 Extension Cable
with EMI/RFI Hoods
(EDN12H), p. 105
Data-Collection
or Control Device
PC with
DB9 Serial Port
DB9 Extension Cable
with EMI/RFI Hoods (EDN12H), p. 105

"Will It Work in My System?" Check the Diagram.

Just trace the cables and connections to see how a particular Black Box solution might fit into your own computer network. Each element in every diagram is color-coded—every cable, every telco service—so it's easy to get "The Big Picture" of how a Black Box product can work for you. See the handy **Diagram Legend** on **page 20**.


In This Section...
U.S. Robotics Modems
Industrial Modems
Data-Center Modems
Phone-Line Sharers

Menu-Style Directional Footers.

It's a big book, but these **Navigational Bars** at the bottom of each page make it easier to use than ever. The red "You-Are-Here" square indicates your location within the Catalog. You'll see what lies ahead in each section and what you've passed, so you won't miss a thing!

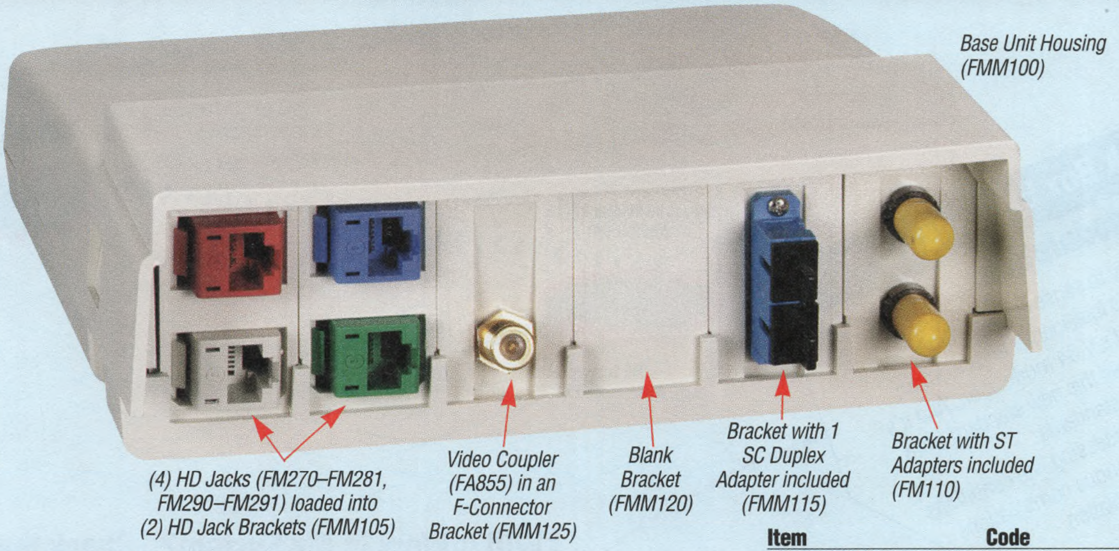
And Finally, 24-Hour FaxBacks and BLACK BOX® ON-LINE.

There's often much more to say about the items you find in the *BLACK BOX® Catalog*. That's why our **FaxBack Information** system is available 24 hours a day, every day. It's easy—just call and enter the Document Number. And of course, you can always visit our **Web Site**, anytime day or night: **http://www.blackbox.com/**

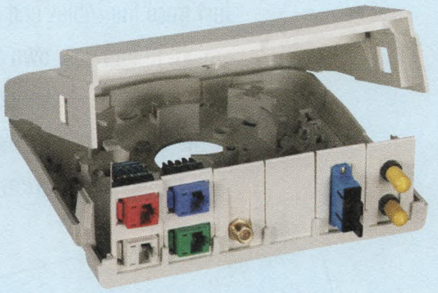
FAXBACK INFORMATION
For Modem Standards: 12386
Call 412-746-5500 Anytime

Advanced Multimedia Outlet

Plan Ahead. Outfit Work Areas with Mixed Media Outlets Now.


Base Unit Housing (FMM100)
(4) HD Jacks (FM270–FM281, FM290–FM291) loaded into (2) HD Jack Brackets (FMM105)
Video Coupler (FA855) in an F-Connector Bracket (FMM125)
Blank Bracket (FMM120)
Bracket with 1 SC Duplex Adapter included (FMM115)
Bracket with ST Adapters included (FM110)

- Use with UTP, STP, fiber ST® and SC, and coax.
- Fiber storage design enables better management of fiber bend radius to extend the fiber life.
- Modular design for easy changes or additions of a variety of media to expand in the future.
- Accommodates 12 fiber or UTP jacks or a combination of other media, including high-density jacks, F, BNC, and RCA® connectors.
- Compatible with the Media Track Systems (**page 132**).
- Hidden label field for 606 documentation.

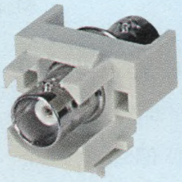


Open up the Base Unit for easy connections and labeling.

Item	Code	Price
Advanced Multimedia Outlet		
Base Unit Housing (6 Bracket Locations)	FMM100	**$11.95**
Brackets		
Single with 2 ST Adapters (Mounted)	FMM110	**$12.95**
with 1 SC Duplex Adapter (Mounted)	FMM115	**$21.95**
10-Pack with 2 HD Jack Outlets (No Connectors)	FMM105	**$5.95**
Blank (No Connectors)	FMM120	**$5.95**
F-Connector, Unloaded	FMM125	**$5.95**

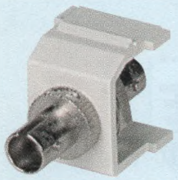
FMM105 has openings only. For HD Jacks, see below.

Snap Fittings



BNC Snap Fitting (F/F) (FM332)

Blank Snap Fitting (FM330)



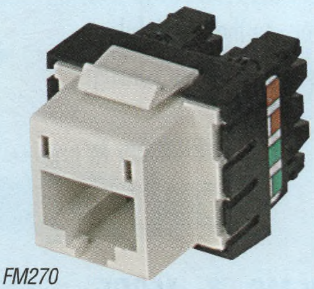
ST Adapter Snap Fitting (FM333)

F Connector Snap Fitting F/F (FM331)

Item	Code	Price
Snap Fittings		
Blank (Pack of 10)	FM330	**$4.49**
F Connector (F/F)	FM331	**$3.49**
ST Adapter	FM333	**$12.95**
BNC (F/F)	FM332	**$9.95**

CAT5 HD Jacks

- Use with Advanced Multimedia Outlet (**above**).
- All jacks exceed EIA/TIA CAT5 requirements for high-quality, reliable service.
- UL® listed/CSA certified.
- Choose T568A or T568B pinning options to suit your cabling plan or existing premise wiring.
- Smaller high-density configuration so you can mount more jacks in plates.
- Use with any Category 5 system.
- Beryllium copper contacts with 50-microinch gold plating ensure superior connectivity.
- Choose from seven colors.



FM270

Color	T568B	T568A	Price
CAT5 HD Jacks			
Off-white	FM270	FM275	**$7.95**
Black	FM271	FM276	**$7.95**
Gray	FM272	FM277	**$7.95**
White	FM273	FM278	**$7.95**
Office White	FM274	FM279	**$7.95**
Red	FM280	FM281	**$7.95**
Blue	FM290	FM291	**$7.95**

MORE! Premise Wiring Accessories, **see pp. 132–145.**

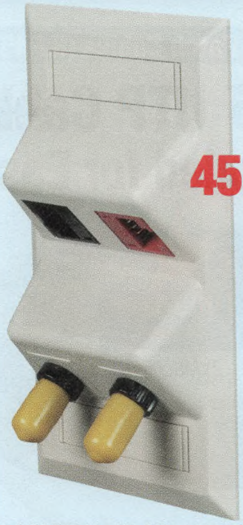
Angled Wallplates

Protect Cables from Furniture and Over-Bending.

- Low-profile multimedia wallplates accommodate HD jacks, ST®, SC duplex, and coax outlets.
- 45° downward angle prevents cables from being damaged by furniture pushed too close to the wall.
- Angled design also maintains the proper bend radius of the cable.
- Field-configurable.
- Both plates include two smooth locations for adhesive labels.
- Plates can be fitted with optional snap-in clear label covers and snap-in or paper inserts.
- WPP300 is designed for flush-mounting and accepts any four high-density jacks or fiber ST connector fittings.
- WPP400 accommodates two high-density jack mountings and one SC duplex adapter.

Item	Code	Price
Angled Wallplates, Single-Gang, Office-White		
4 Flush Keystone Openings (Use Bottom for Fiber ST)	WPP300	**$2.79**
2 Flush Keystone Openings, (1) SC Opening	WPP400	**$2.79**

For HD Jacks, ST and SC Brackets, see facing page.



45° Angle

45° angle protects your cables.

Angled Wallplate with 4 Keystone Openings (WPP300). Top: HD Jacks (FM290 and FM280); Bottom: Fiber ST Bracket (FMM110).

Surface-Mount Housings & Adapters

For truly simple cable installation, stay out of those walls! Use the Surface-Mount Housing to hold your cable terminations and jacks and anchor your faceplate securely to the outside of a wall.

Or, if you must go into the walls, use a Flush-Mount Adapter with flexible anchor arms to quickly set up a wallplate position on drywall without installing an electrical box.

Item		Code	Price
Surface-Mount Box (Off-White)			
Single-Gang	1.63" Deep	WP276	**$5.95**
	1.91" Deep	JPT250	**$4.95**
Double-Gang	1.9" Deep	JPT260	**$9.95**
Flush-Mount Adapters			
Single-Gang		WP274	**$1.95**
Double-Gang		WP275	**$2.95**

CAT5™

WP276
WP274

MORE! Category 5 Accessories, see pp. 138–139.

Flush Wallplates

You get plenty of room to grow with these Flush Wallplates designed for our HD (High-Density) Jacks and Snap Fittings. Mount the Wallplate in a Surface-Mount Box (left) or in a standard wall outlet.

PRODUCTION

Item	Code	Price
Flush Wallplates		
Single Gang (Office White)		
1-Port	WP250	**$3.95**
2-Port	WP251	**$3.95**
3-Port	WP252	**$3.95**
4-Port	WP253	**$3.95**
6-Port	WP270	**$3.95**
Double Gang (Office White)		
6-Port	WP271	**$4.49**

Front-Access Patch Panel

Easy-to-Use and the Right Size for 12-PC Networks.

- 12 ports make this ideal for small law firms, medical practices, insurance companies, and other small offices.
- Super user-friendly. Both the 110 punchdown fields and the Category 5 modular jacks are on the front side. Great for areas with limited rear access.
- Terminates 22–26 AWG solid conductors.
- Includes an integrated cable management bar compliant with 606 requirements.
- A paired 110 punchdown sequence enables pair twist to within ½" of termination.
- Incorporates a new printed circuit-board design (patent-pending).
- A protective cover keeps terminations safe.

CAT5™

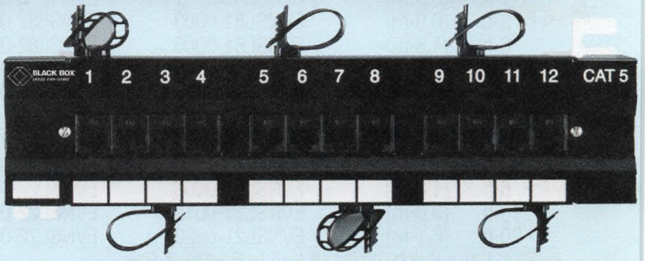
- Mount directly to the wall or on the 89D bracket (included).
- Front and rear labeling fields make port identification easy.
- Jack contacts are beryllium copper with a 50-microinch gold plating.

Size — 10"W x 2.5"H 1.5"D (25.4 x 6.4 x 3.8 cm)

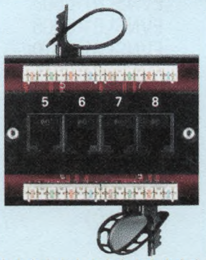
Item	Code	Price
Front-Access Patch Panel, 568-B		
12-Port	JPM050A	**$140.00**
Category 5 Patch Cable 4-Pair, Stranded, Beige	EVMSL05-0010	**$8.95 + $.40/ft.**

remember to order cables

For other lengths and colors, see p. 69.



A removable protective cover features both numerical port identifiers and a write-in area.



Super user-friendly. Both the 110 punch-down fields and the Category 5 modular jacks are on the front side.

CAT5 Color Patch Cables (RJ-45) **STRANDED** **Flexible**

ABSOLUTELY GUARANTEED FOR LIFE

CAT5™ UTP Cables for 100–350-MHz Applications.

Color-Coded for Easy Installation when Patching.

100-MHz
Basic
EVMSL05

100-MHz
Molded Boots
EVNSL25

350-MHz
Snagless,
Molded Boots
EVNSL81

CAT5 Color Patch Cables

- Certified to 100 MHz.
- 10 standard lengths in stock and ready to ship.
- TSB 568B wiring.

SPECIFICATIONS

Cable Construction — PVC
Cable Type — 4-pair stranded UTP
Conductor Gauge — 24 AWG
Frequency — EVNSL81–EVNSL85: Up to 350 MHz;
EVNSL21–EVNSL25: Up to 100 MHz;
EVNSL01–EVMSL05: Up to 100 MHz
Impedance — EVNSL81–EVNSL85: 100 ± 22 ohms;
EVNSL21–EVNSL25: 100 ± 15 ohms;
EVNSL01–EVMSL05: 100 ± 15 ohms
Mutual Capacitance — EVNSL81–EVNSL85: 14 pF/ft.;
EVNSL21–EVNSL25: 15 pF/ft.;
EVNSL01–EVMSL05: 15 pF/ft.
Standards — EIA/TIA TSB40-A Category 5
Wiring Type — 568B
Connectors — RJ-45

CAT5 Color Patch Cables with Molded Boots

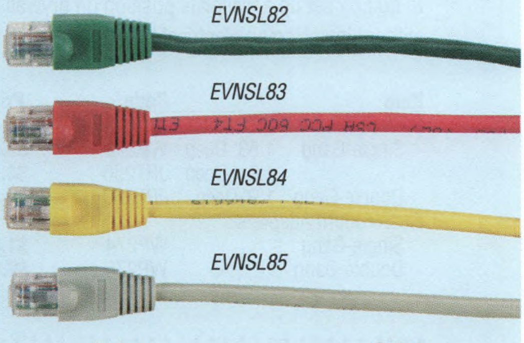
- Certified to 100 MHz.
- Molded boots prevent cable kinks and bent pins when removing from patch panels. And they reduce crosstalk.
- TSB 568B wiring.

PLUS! For Colored CAT5™ Bulk Cables, see p. 115.

FAXBACK INFORMATION
For Color Patch Cables: 13466
For Patch Cables with Molded Boots: 15468
For Enhanced Patch Cables: 19156
Call 412-746-5500 Anytime

CAT5 Super 350 Enhanced Color Patch Cables

- Provide 350-MHz performance, more than *triple* the frequency range of the Category 5 standard.
- Molded, snag-free boots prevent cable kinks and bent pins when removing from patch panels. And they reduce crosstalk.
- TSB 568B wiring.
- Belden DataTwist® 350 UTP Cable.



Item		Blue	Green	Red	Yellow	Beige	Price
CAT5 Super 350 Enhanced Color Patch Cables (RJ-45 to RJ-45), 4-Pair							
1-ft.	(0.3-m)	EVNSL81-0001	EVNSL82-0001	EVNSL83-0001	EVNSL84-0001	EVNSL85-0001	**$8.95**
3-ft.	(0.9-m)	EVNSL81-0003	EVNSL82-0003	EVNSL83-0003	EVNSL84-0003	EVNSL85-0003	**$10.95**
6-ft.	(1.8-m)	EVNSL81-0006	EVNSL82-0006	EVNSL83-0006	EVNSL84-0006	EVNSL85-0006	**$12.95**
10-ft.	(3.0-m)	EVNSL81-0010	EVNSL82-0010	EVNSL83-0010	EVNSL84-0010	EVNSL85-0010	**$14.95**
20-ft.	(6.1-m)	EVNSL81-0020	EVNSL82-0020	EVNSL83-0020	EVNSL84-0020	EVNSL85-0020	**$19.95**
Custom Lengths		EVNSL81	EVNSL82	EVNSL83	EVNSL84	EVNSL85	**$8.95 + $.65/ft.**
CAT5 Color Patch Cables with Molded Boots (RJ-45 to RJ-45), 4-Pair							
3-ft.	(0.9-m)	EVNSL21-0003	EVNSL22-0003	EVNSL23-0003	EVNSL24-0003	EVNSL25-0003	**$7.95**
6-ft.	(1.8-m)	EVNSL21-0006	EVNSL22-0006	EVNSL23-0006	EVNSL24-0006	EVNSL25-0006	**$9.95**
10-ft.	(3.0-m)	EVNSL21-0010	EVNSL22-0010	EVNSL23-0010	EVNSL24-0010	EVNSL25-0010	**$11.95**
20-ft.	(6.1-m)	EVNSL21-0020	EVNSL22-0020	EVNSL23-0020	EVNSL24-0020	EVNSL25-0020	**$15.95**
CAT5 Color Patch Cables (RJ-45 to RJ-45), 4-Pair							
1-ft.	(0.3-m)	EVNSL01-0001	EVNSL02-0001	EVNSL03-0001	EVNSL04-0001	EVMSL05-0001	**$4.95**
3-ft.	(0.9-m)	EVNSL01-0003	EVNSL02-0003	EVNSL03-0003	EVNSL04-0003	EVMSL05-0003	**$6.95**
6-ft.	(1.8-m)	EVNSL01-0006	EVNSL02-0006	EVNSL03-0006	EVNSL04-0006	EVMSL05-0006	**$8.95**
10-ft.	(3.0-m)	EVNSL01-0010	EVNSL02-0010	EVNSL03-0010	EVNSL04-0010	EVMSL05-0010	**$10.95**
15-ft.	(4.5-m)	EVNSL01-0015	EVNSL02-0015	EVNSL03-0015	EVNSL04-0015	EVMSL05-0015	**$11.95**
20-ft.	(6.1-m)	EVNSL01-0020	EVNSL02-0020	EVNSL03-0020	EVNSL04-0020	EVMSL05-0020	**$14.95**
25-ft.	(7.5-m)	EVNSL01-0025	EVNSL02-0025	EVNSL03-0025	EVNSL04-0025	EVMSL05-0025	**$16.95**
30-ft.	(9.0-m)	EVNSL01-0030	EVNSL02-0030	EVNSL03-0030	EVNSL04-0030	EVMSL05-0030	**$19.95**
50-ft.	(15.0-m)	EVNSL01-0050	EVNSL02-0050	EVNSL03-0050	EVNSL04-0050	EVMSL05-0050	**$22.95**
100-ft.	(30.0-m)	EVNSL01-0100	EVNSL02-0100	EVNSL03-0100	EVNSL04-0100	EVMSL05-0100	**$36.95**
Custom Lengths		EVNSL01	EVNSL02	EVNSL03	EVNSL04	EVMSL05	**$8.95 + $.40/ft.**

BLACK BOX® + Belden = the best!

FAXBACK INFO
For All Cables on This Page: 18698
Call 412-746-5500
Anytime

MediaTwist UTP Cable

Belden MediaTwist™ 350—A True Multimedia Cable!

SOLID

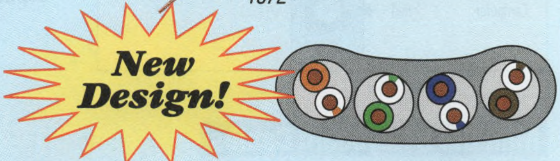
- Goes far beyond Category 5 standards.
- Use for shared-sheath voice, high-speed data, audio, and professional-broadcast 270-Mbps digital video applications.
- Unique patent-pending design and process produces an extremely stable cable with improved electrical performance.
- Unique crescent-shape design—each pair is "locked" into place. No matter how much cable is twisted during installation, the cable performs.
- Exceptional ACR (attenuation to crosstalk ratio).
- Offers additional headroom for future growth.

MEDIA TWIST
CABLE WITH CONFIDENCE™

SPECIFICATIONS

Cable Construction — 1872A: PVC; polyolefin insulated PVC jacket;
1874A: Plenum, FEP Teflon® and polyolefin insulated Flamarrest™ jacket
Cable Type — 4-pair solid, copper UTP
Conductor Gauge — 24 AWG
Frequency — Up to 350 MHz
Impedance — Up to 100 ± 12%
Nominal Capacitance — 15 pF/ft.
Maximum Conductor — 27.4 ohms/1000 ft.
Standards — EIA/TIA 568-A Category 5
Weight/ — 1872A: 29 lb./1000 ft. (13.2 kg/100 m);
1874A: 31 lb./1000 ft. (14 kg/100 m)

1872



Item		Code	Price
MediaTwist UTP Cable, Solid, 4-Pr., 1000-ft. (304.8-m)			
PVC NEC® CM	Gray	1872A-F6H-A1000	**$195.95**
	Blue	1872A-6-A1000	**$195.95**
Plenum NEC® CMP			
	Gray	1874A-877-A1000	**$569.95**
	Blue	1874A-D15-A1000	**$569.95**

DataTwist 350 UTP Cable

Belden DataTwist® 350 Superior 350-MHz UTP Cables.

SOLID STRANDED

- Unique, patent-pending design and process.
- Offers stable electrical performance at 350 MHz, more than triple the verified range of the EIA/TIA 568-A Category 5 standard.
- UL® listed/CSA approved.
- Offers much greater performance in key areas: capacitance, frequency, resistance, attenuation, NEXT, and impedance.

SPECIFICATIONS

Cable Construction — 1700A, 1752A: PVC;
1701A: FEP Teflon
Cable Type — 4-pair solid or stranded copper UTP
Conductor Gauge — 24 AWG
Frequency — Up to 350 MHz
Impedance — 100 ± 22%
Nominal Capacitance — 14 pF/ft.
Standards — EIA/TIA 568-A Category 5
Weight — 1700A: 27.6 lb./1000 ft. (4.2 kg/100 m);
1701A: 25.1 lb./1000 ft. (3.8 kg/100 m);
1752A: 21.1 lb./1000 ft. (3.2 kg/100 m)

ABSOLUTELY GUARANTEED FOR LIFE

Enhanced CAT5™

1700A

Item		Code	Price
DataTwist 350 UTP Cable, Solid, 4-Pair, 1000-ft. (304.8-m)			
PVC NEC® CM	Gray	1700A-Gray	**$189.95**
	Blue	1700A-Blue	**$189.95**
Plenum NEC® CMP			
	Natural	1701A-Gray	**$395.95**
	Blue	1701A-Blue	**$395.95**

Item	Gray	Red	Orange	Yellow	Green	Lt. Blue	Violet	Price
DataTwist 350 Patch Cable, Stranded, 4-Pair, 100-Ohm, NEC®, CM								
PVC 1000-ft. (304.8-m)	1752A-1000-F2	1752A-1000-2	1752A-1000-3	1752A-1000-4	1752A-1000-5	1752A-1000-6	1752A-1000-7	**$229.95**

DataTwist 5 UTP Cable

Belden DataTwist® 5 Superior 100-MHz UTP Cables.

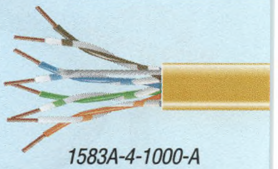
SOLID

CAT5™

ABSOLUTELY GUARANTEED FOR LIFE

SPECIFICATIONS

Cable Construction — 1583A: PVC;
1585A: FEP Teflon (plenum)
Cable Type — Solid copper UTP
Conductor Gauge — 24 AWG
Frequency — Up to 100 MHz
Impedance — 100 ± 15 ohms
Nominal Capacitance — 15 pF/ft.
Standards — EIA/TIA 568-A Category 5
Weight — 1583A: 14.8 lb./1000 ft. (2.2 kg/100 m);
1585A: 27.9 lb./1000 ft. (4.2 kg/100 m)



1583A-4-1000-A

Item	Red	Yellow	Green	Blue	Beige	White	Price
DataTwist 5 UTP Cable, Solid, 4-Pair, Boxed, 1000-ft. (304.8-m)							
PVC	1583A-2-1000-A	1583A-4-1000-A	1583A-5-1000-A	1583A-6-1000-A	1583A-F6H-1000-A	—	**$139.95**
Plenum	—	—	—	1585A-D15-1000-A	—	1585A-877-1000-A	**$269.95**

Belden Cable Stripper

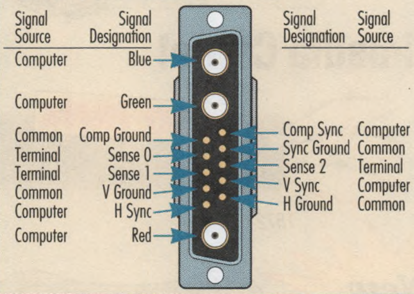
The Stripper Made Just for Belden Cable.

- Easily strips the outer jacket from 2-, 3-, and 4-pair Belden cable.
- Straightens and separates adjoined conductors of DataTwist 350 cable.
- Won't damage the inner conductor insulation.

Item	Code	Price
Belden Cable Stripper	1799A	**$5.95**

Black Box Explains...

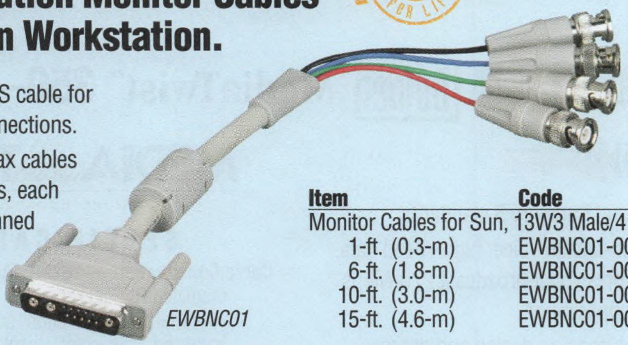
13W3 Pinning.


Signal Source
Signal Designation
Computer Blue
Computer Green
Common Comp Ground
Terminal Sense 0
Terminal Sense 1
Common V Ground
Computer H Sync
Computer Red
Signal Designation
Signal Source
Comp Sync Computer
Sync Ground Common
Sense 2 Terminal
V Sync Computer
H Ground Common

Monitor Cables for Sun

High-Resolution Monitor Cables for Your Sun Workstation.

- Color-coded RGBS cable for easy monitor connections.
- 28 AWG, mini-coax cables have 4 conductors, each shielded with a tinned copper braid.



EWBNC01

Item	Code	Price
Monitor Cables for Sun, 13W3 Male/4 BNC Male		
1-ft. (0.3-m)	EWBNC01-0001	**$69.95**
6-ft. (1.8-m)	EWBNC01-0006	**$79.95**
10-ft. (3.0-m)	EWBNC01-0010	**$94.95**
15-ft. (4.6-m)	EWBNC01-0015	**$114.95**

Mini DIN 8 Keyboard Cables

Keyboard and Mouse Cables for Your Sun Workstation.

- Convenient extension or replacement cables.
- This 28 AWG, foil-shielded cable features 8 conductors and a drain wire.

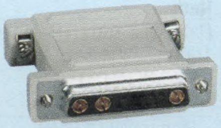
EVMK8

Item	Code	Price
Mini DIN 8 Keyboard Cables		
Male/Male		
6-ft. (1.8-m)	EVMK8-0006-MM	**$15.95**
10-ft. (3.0-m)	EVMK8-0010-MM	**$17.95**
15-ft. (4.6-m)	EVMK8-0015-MM	**$21.95**
Male/Female, Extension		
6-ft. (1.8-m)	Coiled EVMK8-0006-MF	**$15.95**
25-ft. (7.6-m)	Straight EVMK8-0025-MF	**$34.95**

Gender Changers

Gender Changers for Instant Sun Workstation Compatibility.

ACD002



FA13W3

FAMD8

- For Sun® Workstation® and high-end Mac® connections.

CE Approval — ACD002

Item	Code	Price
Sun 13W3 to HD15F Adapter	ACD002	**$34.95**
13W3 Gender Changer, F/F	FA13W3	**$48.95**
Mini DIN 8 Gender Changer, F/F	FAMD8	**$8.95**

◆ ◆ ◆

SCSI-5 to SCSI-3 Cable

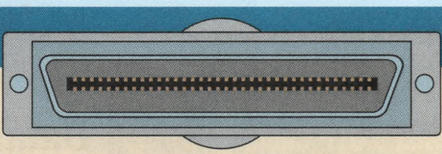
The Right Connection for Ultra SCSI Fast 20 Cards!

- 0.8 mm to MD68, 30 AWG cable features new smaller footprint.
- Attach a SCSI-3 peripheral to an Ultra SCSI Fast 20 Card.

Item	Code	Price
SCSI-5 to SCSI-3 Cable, Male/Male		
3 ft. (0.9-m)	EVMS8-0003-MM	**$94.95**
6 ft. (1.8-m)	EVMS8-0006-MM	**$104.95**

Black Box Explains...

SCSI-5.



SCSI-5, a new type of connector interface, is also called VHDCI (Very High-Density Connector Interface) or a 0.8-mm connector. It's similar to the SCSI-3 MD68 connector in that it has 68 pins but features a much smaller footprint.

SCSI-5 is designed for next-generation SCSI connections where high performance is a key requirement. Manufacturers, such as IBM® and Hewlett-Packard®, are integrating this new 0.8-mm connector design in their controller cards. It's the connector of choice for advanced SCSI multiport applications, such as Ultra SCSI Fast-20, and the new Low-Voltage Differential Signal (LVDS) technology.

One popular application is to run an external SCSI-3 CD-ROM drive from one of these new 0.8-mm controller cards.

Because of SCSI-5's special offset cable exit, up to four channels can be accomodated in one card slot. Connections are also easier where space is limited.

MORE! SCSI Cables, Adapters, and Terminators, **see pp. 96–101.**

In This Section...
Cables/Connectors
Equipment Protection/Testers
Switches

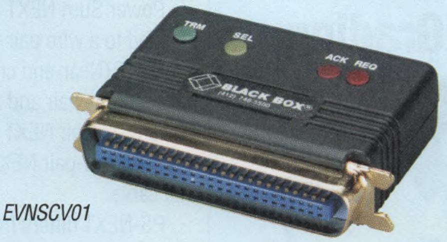
Active Diagnostic SCSI Terminators

Detect Problems in Your SCSI Bus *Before* Your Data is Damaged.

- Active regulation improves SCSI performance, so you see fewer errors and more reliable data transfers.
- Lab engineers and field technicians find these SCSI terminators an invaluable diagnostic tool for debugging high-end SCSI buses, such as UNIX® and Windows NT™ servers.
- Status indicators help you diagnose problems and analyze signal quality.
- Gold contacts offer long-lasting reliability and better conduction.
- With the optional Remote LED pack, you can keep an eye on status indicators which may be hidden deep inside equipment.
- All Terminators operate at 110 ohms.

Item	Code	Price
Active Diagnostic SCSI Terminators		
50-Pin Centronics®	EVNSCV01	**$59.95**
50-Pin Micro D	EVNSCV02	**$79.95**
68-Pin Micro D	EVNSCV03	**$99.95**
60-Pin Micro D, Differential	EVNSCV04	**$99.95**
Optional Remote LED Pack	EVNSCV05	**$19.00**

remember to order cables ***Different applications require different cables. Call Tech Support to be sure you order the right one.***



EVNSCV01

BLACK BOX
REQ
ACK
SEL
TRM

EVNSCV04

BLACK BOX
REQ ACK
SEL TRM

EVNSCV02

BLACK BOX
REQ ACK
SCSIVue
SEL TRM

EVNSCV05

BLACK BOX
REQ ACK
SEL TRM

EVNSCV03

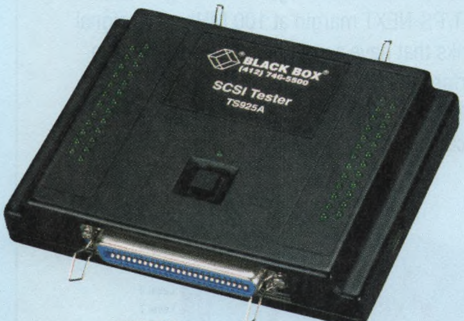
MORE! SCSI Terminators, see p. 101.

◆ ◆ ◆

SCSI Testers

The Low-Cost Solution for Detecting SCSI Cable Problems.

- Debug your SCSI bus by checking your cable's quality.
- Quickly determine if your SCSI cable is functioning properly. Poorly designed or damaged cables are a major source of problems in high-end applications.
- Ideal for lab engineers and field-service technicians.
- Simple one-step, one-push test checks for open lines, short circuits, and inconsistent or improper operation.
- Compact design makes it easy to tote along in the field.
- Gold contacts provide better electrical contact and extend the life of the tester.
- Choose from three connector types for testing approximately 99% of all SCSI cable types.
- Numbered LED readout indicates the status of each line and shows exactly which lines are below specifications.
- Use with SCSI adapters (**page 97**) to test different types of SCSI cable.



TS925A

SPECIFICATIONS

Connectors — TS920A: (2) 50-Pin male IDC;
TS925A: (2) 50-Pin female Centronics;
TS930A: (2) 68-Pin female MicroD
Power — 9-V battery included
Size — 5.4"H x 1"W x 4"D (13.7 x 2.5 x 10.1 cm)
Weight — 0.6 lb. (0.3 kg)

PLUS! SCSI Cables, see pp. 97–100.

Item	Code	Price
SCSI Testers		
50-Pin IDC	TS920A	**$57.95**
50-Pin Centronics	TS925A	**$69.95**
68-Pin MicroD	TS930A	**$89.95**

remember to order cables ***Different applications require different cables. Call Tech Support to be sure you order the right one.***

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Certify Category 5 Plus Cable with Power Sum, Cable Grading, and Skew!

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BLACK BOX
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TwoWay

TS699A TS690A

Now you can use SCAN-LAN V Two-Way and SCAN-LAN Vt to:

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- Measure link performance compared to the minimum NEXT/PS-NEXT requirement with the new Cable Grading test.
- Automatically measure Propagation Delay and Propagation Delay Skew and include the results in test reports.
- Run an ACR (attenuation to crosstalk ratio) test against specified ACR limits.
- Add a resistance measure to any twisted-pair Autotest suite or run as a standalone test.
- Add a characteristic impedance measurement to any twisted-pair cable Autotest or run as a standalone test.

CE Approval — TS699A

FAXBACK INFO
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Anytime

Item	Code	Price
SCAN-LAN V Two-Way	TS690A	**$3995.00**
SCAN-LAN Vt	TS699A	**$4395.00**

PLUS! SCAN-LAN Fiber Optic Modules and Accessories, **see p. 199.**

Free Upgrade!

FREE SCAN-LAN Upgrade!

Not sure if you have the newest SCAN-LAN features? Check the first screen display on your SCAN-LAN—it should read version 3.2. If you have an earlier version, you can get a free upgrade for PS-NEXT, cable grading, and propagation delay/delay skew. You can either download the software from the Black Box Bulletin Board at **412-746-7120**, or call Customer Service at **412-746-5500**, press **1, 3** and request a free copy of the upgrade on diskette.

Black Box Explains...

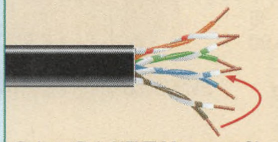
Power Sum NEXT (PS-NEXT).

Power Sum NEXT (PS-NEXT) is the sum of the total NEXT power coupled to a wire pair from all other adjacent pairs.

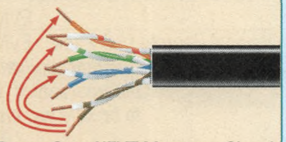
NEXT (Near-end crosstalk) is the level of interference that occurs between one pair and another pair within a four-pair cable. TSB-67 requires that pair-to-pair NEXT be measured on all pair combinations in a cable. The worst pair-to-pair NEXT measure should not exceed the specified limits for that cable.

PS-NEXT differs from NEXT in that it's a much more rigorous crosstalk measurement. It measures the total possible crosstalk coupled from multiple wire pairs in the same cable sheath, not just the crosstalk from any one pair to another pair. According to TIA 568A, PS-NEXT is the required method for measuring NEXT of mutiple-pair (more than four pair) backbone cable. PS-NEXT can be figured from the individual, pair-to-pair NEXT measurements.

PS-NEXT is a critical measurement for new high-speed networks such as ATM 622 Mbps and Gigabit Ethernet, which use simultaneous parallel transmission. Many manufacturers of Category 5 cables are already specifying PS-NEXT tests. Cables that meet PS-NEXT requirements should deliver superior performance and will be able to support higher-speed transmission schemes as they are implemented.



Pair-to-Pair NEXT Measures Signal Coupled between Any Two Pairs



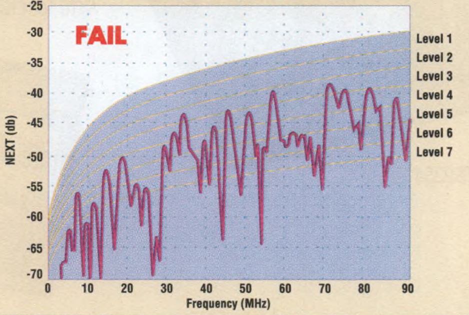
Power Sum NEXT Measures Signal Coupled from All Adjacent Pairs

Cable Grading.

This new test grades the Category 5 link instead of simply identifying pass/fail conditions. It quantifies how much better the link performs compared to the NEXT minimum requirements. Link performance is graded based on the amount of NEXT or PS-NEXT headroom (margin) relative to the NEXT limit. This enables contractors and cable installers to assess the quality of the Category 5 link more accurately. With cable grading, you can tell if one cable barely passes the TSB-67 standards, while different cable may offer up to 70 percent better signal-to-noise ratios.

Cable grading measures the amount of NEXT in decibels at a variety of frequencies within the cable's operating bandwidth. It breaks the links into seven grade levels, each 3 dB wide. Each grade level represents a 3-dB improvement in NEXT/PS-NEXT margin at 100 MHz and a signal power difference of 2X. Links that have a worst-case performance in grade level 2 are better performers than links in grade level 1.

The figure below shows a sample performance-grading test result. This example illustrates a cable passing at grade level 3.



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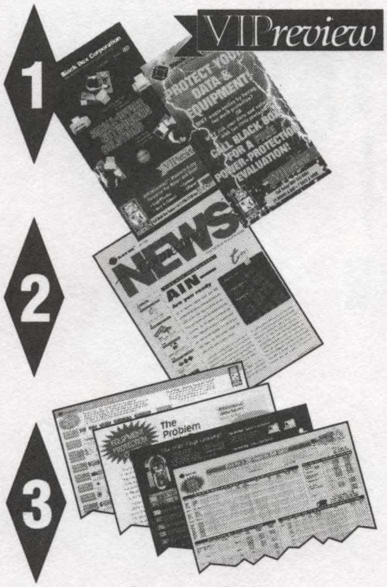
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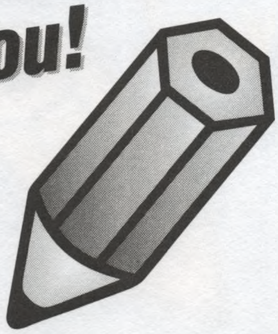

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2. Complete and fax the form to our 24-Hour Fax Line: **800-321-0746**.
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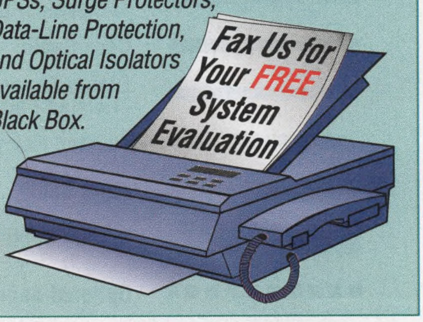
*See **pages 175–195** for the complete selection of UPSs, Surge Protectors, Data-Line Protection, and Optical Isolators available from Black Box.*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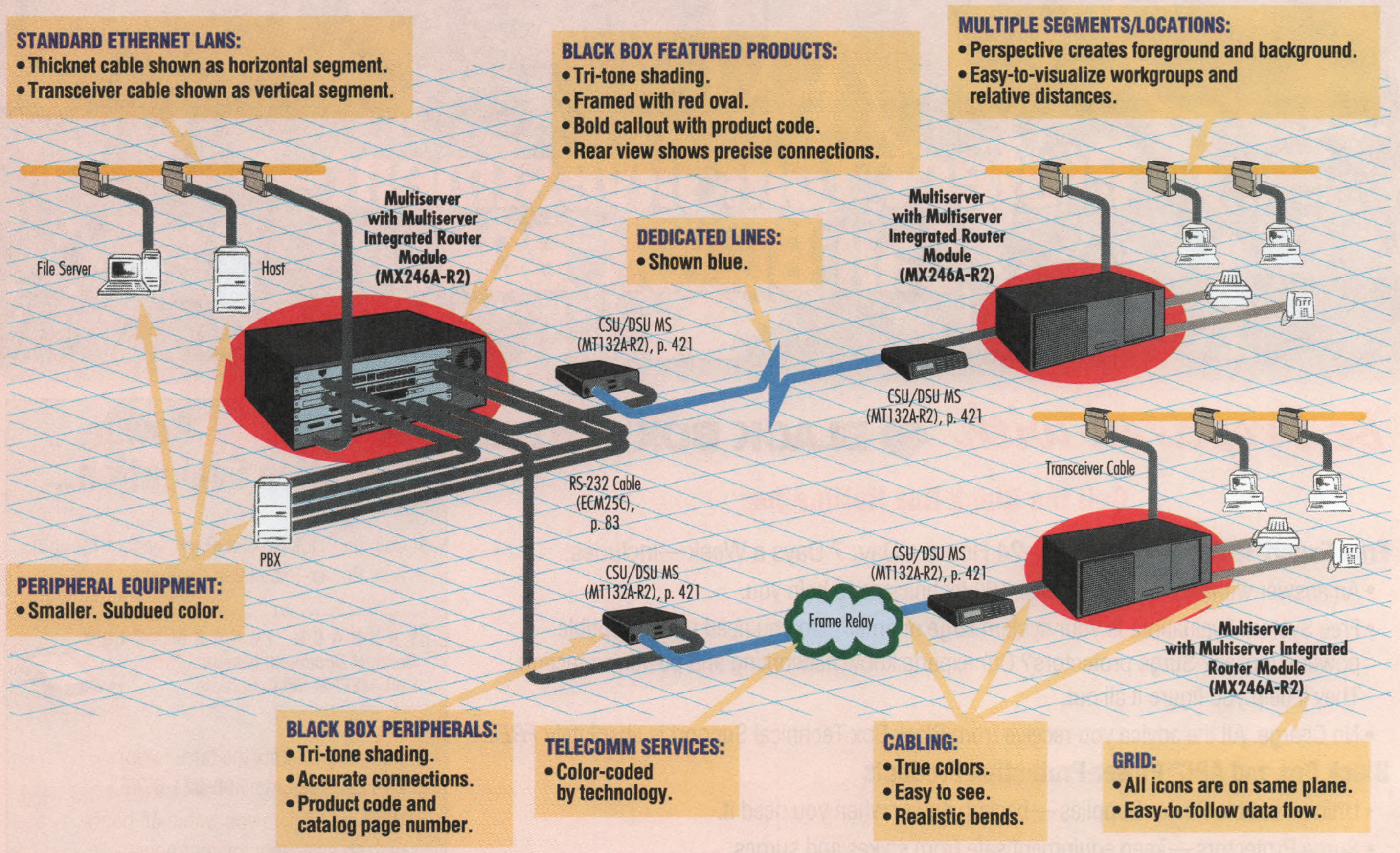
Our Pictures Are Worth a *Thousand* Words!

Even ordinary applications can get confusing once you start linking multiple cable platforms and network services. That's why we've developed our distinctive diagrams. Just one look at them and you can understand the most complex applications.

Our color-coded diagrams help you distinguish between the technologies you may encounter in a multiplatform operation, such as Ethernet, T1, ISDN, and modem lines. By using our diagrams, you're sure to find everything you need to design, install, or expand the *perfect* network for your business.

BLACK BOX® Diagrams illustrate how our technologies can be used on the job, so you can see the entire product environment and determine whether our solution is right for your application. You'll find all the relevant components—from Multiservers to Cables—shown in a clear, graphic style, so you can order everything you need the first time with *just one phone call!*

Let BLACK BOX® Diagrams show you how.



File Server
Host
PBX
Multiserver with Multiserver Integrated Router Module (MX246A-R2)
CSU/DSU MS (MT132A-R2), p. 421
RS-232 Cable (ECM25C), p. 83
Frame Relay
Transceiver Cable
Multiserver with Multiserver Integrated Router Module (MX246A-R2)

STANDARD ETHERNET LANS:
- Thicknet cable shown as horizontal segment.
- Transceiver cable shown as vertical segment.

BLACK BOX FEATURED PRODUCTS:
- Tri-tone shading.
- Framed with red oval.
- Bold callout with product code.
- Rear view shows precise connections.

MULTIPLE SEGMENTS/LOCATIONS:
- Perspective creates foreground and background.
- Easy-to-visualize workgroups and relative distances.

DEDICATED LINES:
- Shown blue.

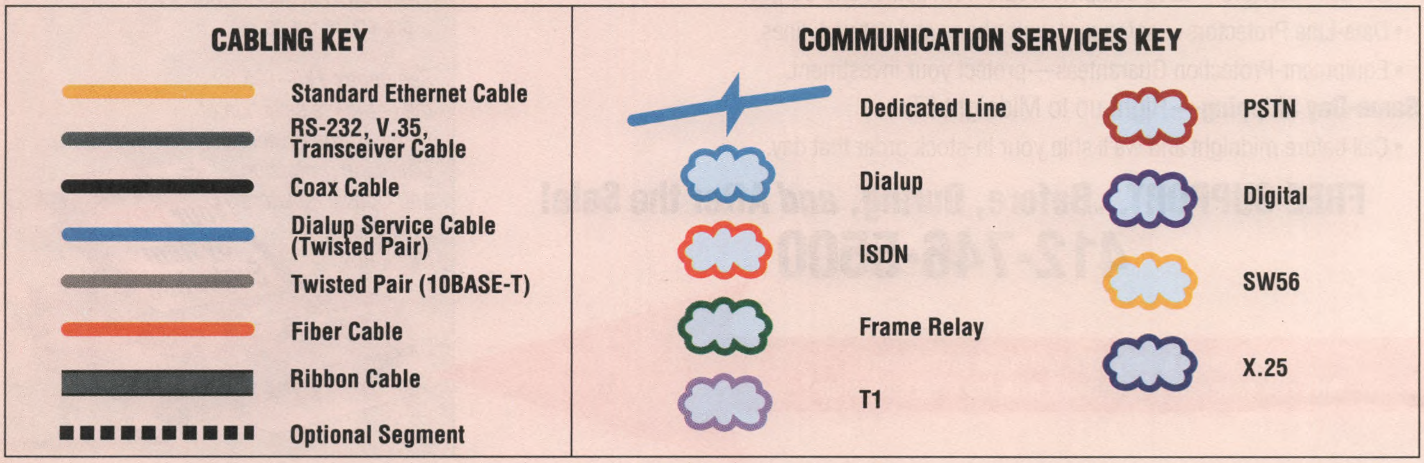
PERIPHERAL EQUIPMENT:
- Smaller. Subdued color.

BLACK BOX PERIPHERALS:
- Tri-tone shading.
- Accurate connections.
- Product code and catalog page number.

TELECOMM SERVICES:
- Color-coded by technology.

CABLING:
- True colors.
- Easy to see.
- Realistic bends.

GRID:
- All icons are on same plane.
- Easy-to-follow data flow.



CABLING KEY

- Standard Ethernet Cable
- RS-232, V.35, Transceiver Cable
- Coax Cable
- Dialup Service Cable (Twisted Pair)
- Twisted Pair (10BASE-T)
- Fiber Cable
- Ribbon Cable
- ■■■■■■■■■■ Optional Segment

COMMUNICATION SERVICES KEY

- Dedicated Line
- Dialup
- ISDN
- Frame Relay
- T1
- PSTN
- Digital
- SW56
- X.25

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See p. 278.

ServManager Overlay Option Board

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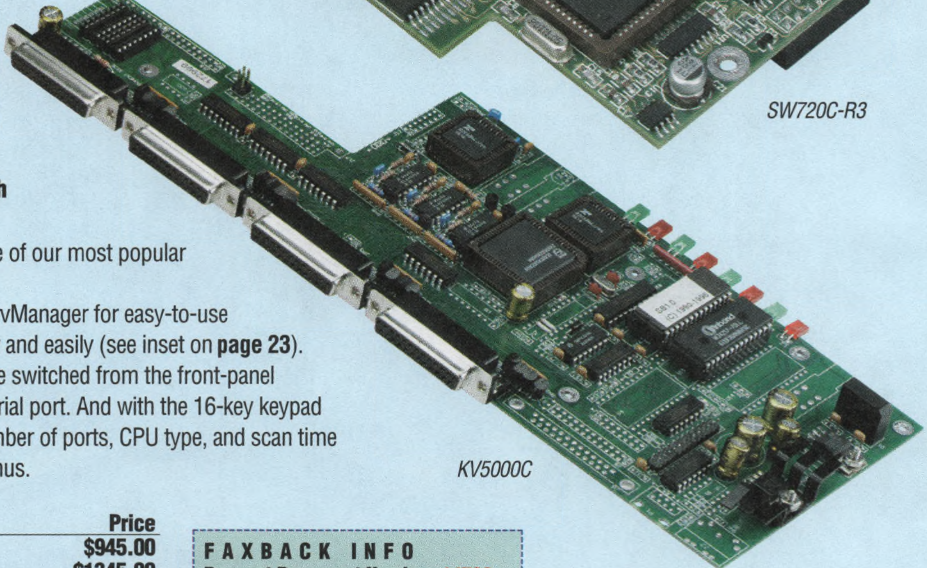
- **Add more CPUs to your ServManager with the Expansion Board.**

The multiplatform ServManager grows along with your enterprise. Buy a ServManager with as many ports as you need *now*, then add more ports *later* as your installation expands—it's easy with our 4-Port Expansion Card. You can upgrade the 4-Port ServManager 4 ports at a time to a full 16 ports. Note that this new version of the ServManager requires a different (and less expensive!) expansion card than our original ServManager.

And, when you need even more ports, just add another ServManager. With Black Box ServManagers, you can control up to 256 network servers from a single keyboard, monitor, and mouse.

On-Screen Menus Now Available!

SW720C-R3



KV5000C

Now with an Exciting New Option:

New **Add easy on-screen menus with the ServSwitch Overlay Option Board.**

Our popular ServManager has been updated to accept one of our most popular expansion cards—the ServSwitch Overlay Option Board.

Just add the ServSwitch Overlay Option Board to your ServManager for easy-to-use on-screen menus. Identify and select attached servers quickly and easily (see inset on **page 23**).

As with all our ServSwitches, the ServManager can also be switched from the front-panel keypad with keyboard commands, or from the the RS-232 serial port. And with the 16-key keypad and built-in alpha-numeric display, you can configure the number of ports, CPU type, and scan time directly from the ServManager as well as from on-screen menus.

Item		Code	Price
ServManager	4-Port	SW995A-R2	**$945.00**
	8-Port	SW996A-R2	**$1345.00**
	12-Port	SW997A-R2	**$1845.00**
	16-Port	SW998A-R2	**$2345.00**
4-Port Expansion Card		KV5000C	**$600.00**
New ServSwitch Overlay Option Board		SW720C-R3	**$300.00**
remember to order cables ServSwitch-to-ServSwitch Expansion Cable Coax, 5-ft. (1.5-m)		EHN274-0005	**$92.50**

For more ServSwitch cables, see pp. 284–285.

FAXBACK INFO
Request Document Number: 14766
Call 412-746-5500
Anytime

MORE! Information on our ServManager, **see p. 278.**

◆ ◆ ◆

10-Mbps ABC Manual Switch

At Last—a Simple Manual Switch for Ethernet!

GUARANTEED FOR LIFE
A B
BLACK BOX
ABC SWITCH
RJ-45

- One PC can switch between two Ethernet networks.
- Or two PCs can take turns accessing one Ethernet connection.
- Guaranteed for life.

FAXBACK INFORMATION
Request Document Number: 14766
Call 412-746-5500 Anytime

SPECIFICATIONS

Connectors — (3) RJ-45
Size — 3.5"H x 6"W x 6.3"D (8.9 x 15.2 x 16 cm)
Weight — 1.5 lb. (0.7 lb.)

Item	Code	Price
10-Mbps ABC Manual Switch	SWL065A	**$65.00**
remember to order cables Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned, PVC	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

Works with our ServSwitch Multi.

See pp. 282–283.

ServSwitch Multi Category 5 Expansion Cards and On-Screen Option

Daisychain Your ServSwitch Multi with Adaptable Category 5 Twisted-Pair Cable.

- **One of the most versatile ServSwitches we sell.**
- **Multiuser—any of up to four connected users can control any connected CPU.**
- **Multiplatform—mix and match PC, PS/2, Sun, and Mac CPUs.**
- **Use PS/2, Sun, or Mac keyboards and mice.**
- **Daisychain up to 3000 additional CPUs by adding Expansion Chassis and Cards.**

Now with Even More Options:

- New **Use the Universal User Card with On-Screen to add on-screen menus to the ServSwitch Multi.**
- New **Add the Category 5 Expansion Cards to connect ServSwitch Multi Expansion Modules with Category 5 twisted-pair cable.**

ServSwitch Multi Category 5 Expansion Cards work just like our ordinary Expansion Cards but feature RJ-45 connectors for cable. So now, instead of using 10-ft. cables, you can use easy-to-handle UTP Cable to connect the Expansion Chassis up to *250 ft.* away from the Base Unit.

Each Category 5 Expansion Card has two sets of three RJ-45 connectors for daisychaining modules—one for video, one for keyboard and mouse, and one for audio. When daisychaining the ServSwitch Multi Expansion Chassis, maximum distance between the Base Unit and the last Expansion Chassis in the chain cannot exceed 250 ft. (76.3-m).

The User Card with On-Screen slides into the ServSwitch Multi Base Unit and adds support for one workstation *plus* on-screen menus. See inset **below** for a complete description of on-screen menus.

Item	Code	Price
ServSwitch Multi Base Unit	KV150A	**$995.00**
Expansion Chassis	KV160A	**$695.00**
New Universal User Card with On-Screen	KV2550C	**$600.00**
Category 5 Expansion Cards		
Transmit	KV1603C	**$400.00**
Receive	KV1604C	**$400.00**

remember to order cables

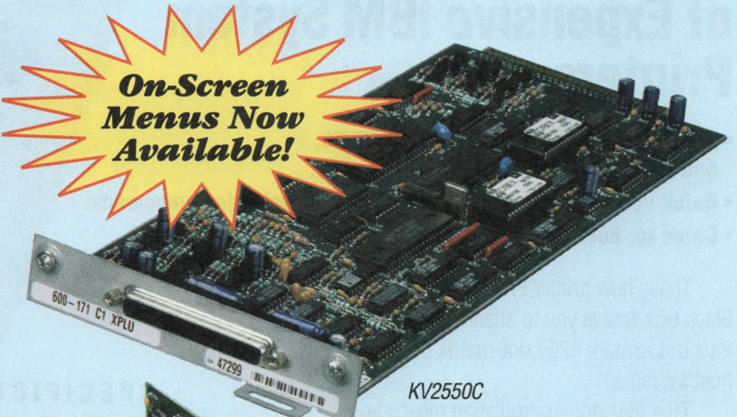
Cabling for KV1603 and KV1604:

Category 5 Solid Conductor Cable, 4-Pair, Straight-Pinned

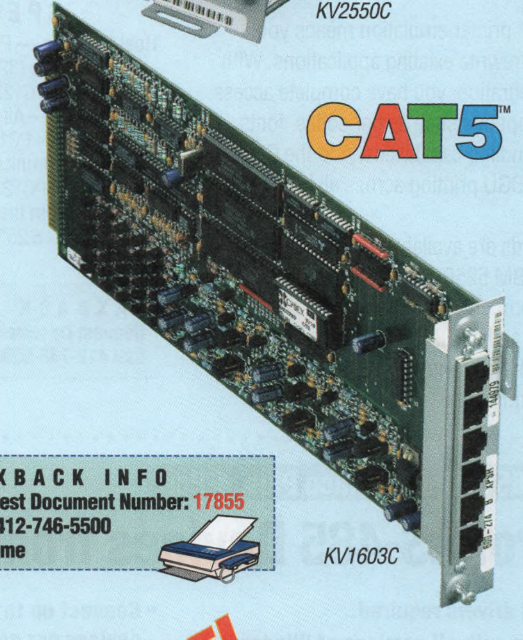
Length	Code	Price
10-ft. (3.0-m)	EYN737MS-0010	**$10.95**
50-ft. (15.0-m)	EYN737MS-0050	**$18.95**
100-ft. (30.0-m)	EYN737MS-0100	**$27.95**
250-ft. (76.2-m)	EYN737MS-0250	**$74.95**

For other lengths and pinnings, see p. 68.

For more ServSwitch cables, see pp. 284–285.



KV2550C



KV1603C

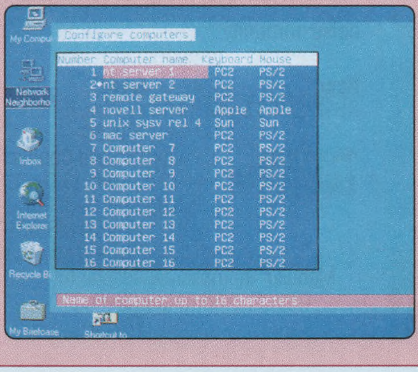
CAT5™

FAXBACK INFO
Request Document Number: 17855
Call 412-746-5500
Anytime

MORE!

Information on our ServSwitch Multi, **see pp. 282–283.**

On-Screen Menus Make ServSwitches Easier to Use!



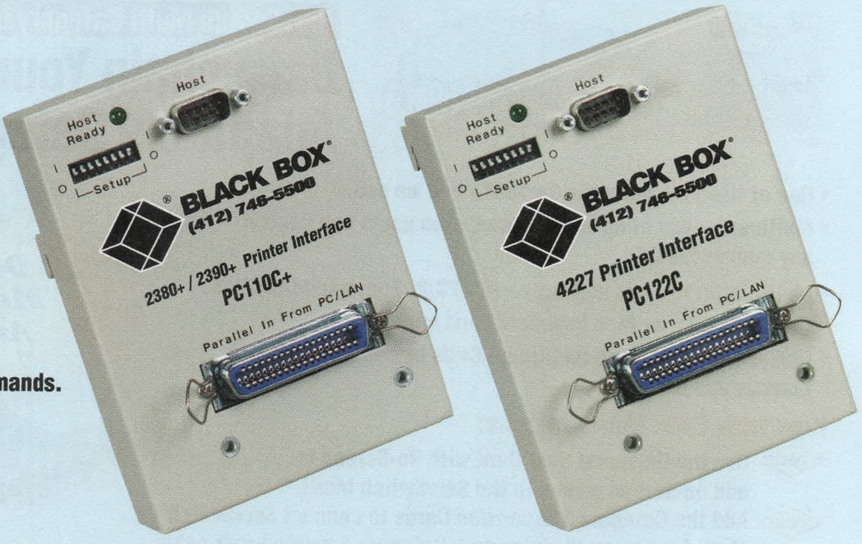
```
Configure computers

Number Computer name  Keyboard Mouse
     1 nt server 1     PC2     PS/2
     2•nt server 2     PC2     PS/2
     3 remote gateway  PC2     PS/2
     4 novell server   Apple   Apple
     5 unix sysv rel 4 Sun     Sun
     6 mac server      PC2     PS/2
     7 Computer  7     PC2     PS/2
     8 Computer  8     PC2     PS/2
     9 Computer  9     PC2     PS/2
    10 Computer 10     PC2     PS/2
    11 Computer 11     PC2     PS/2
    12 Computer 12     PC2     PS/2
    13 Computer 13     PC2     PS/2
    14 Computer 14     PC2     PS/2
    15 Computer 15     PC2     PS/2
    16 Computer 16     PC2     PS/2

Name of computer up to 16 characters
```

To add on-screen menu capabilities to one of the ServSwitches on these pages, simply slip a card into an empty slot. The ServSwitch Overlay Option Board or the ServSwitch Multi On-Screen User Card enables you to:

- Configure CPU, keyboard, and mouse types from an on-screen setup menu.
- Give each server a name that makes sense to you.
- Identify and select attached servers quickly and easily.
- Position the menu window anywhere you choose on your screen. Choose the color of the window, too.
- Program the computer-label fadeout time.

Printer Emulation Cards

Use Inexpensive Async Printers Instead of Expensive IBM System Printers.



- **True emulation of IBM 4214, 5224/25/56, and 3287/68/62 printers.**
- **Quick configuration via DIP switches or downloaded commands.**
- **Cards for both twinax and coax hosts.**

These new printer Emulation Cards from Black Box enable you to attach Lexmark™ 23XX Plus or Lexmark 4227 dot-matrix printers to IBM® host systems.

True IBM printer emulation means you don't have to rewrite existing applications. With seamless integration, you have complete access to all printer options such as bar codes, fonts, and paper-handling capabilities. And the Cards support APF/BGU printing across all IBM printer emulations.

Both Cards are available for coax (IBM 3270) and twinax (IBM 5250) hosts. An additional Centronics® port enables printer sharing between the IBM host and a PC. Both Cards are easy to configure with DIP switches and host/PC download commands.

SPECIFICATIONS

Host Systems — PC110C+, PC123C: IBM Coax (3270); PC111C+, PC122C: IBM Twinax (5250);
CE Approval — All items listed are approved
Connectors — PC110C+, PC123C: (1) Coax, (1) Centronics; PC111C+, PC122C: (1) Twinax, (1) Centronics;
Power — From the interface
Size — 4"H x 5.25"W x 1"D (10 x 13 x 2.5 cm)

FAXBACK INFORMATION
Request Document Number: 19376
Call 412-746-5500 Anytime

Item	Code	Price
2380+/2390+ Emulation Cards		
Coax	PC110C+	**$895.00**
Twinax	PC111C+	**$895.00**
4227 Emulation Cards		
Coax	PC123C	**$895.00**
Twinax	PC122C	**$895.00**
remember to order cables Twinaxial Cable 10-ft. (3.0-m)	EWN010-0010	**$44.95**
For other lengths, see p. 79.		
Coaxial Cable 10-ft. (3.0-m)	ETN59-0010-BNC	**$9.95**
For other lengths, see p. 79.		
Centronics Extension Cable, 10-ft. (3.0-m)	EQN380-0010	**$35.55**
For other lengths, see p. 105. ***Specify gender when ordering.***		

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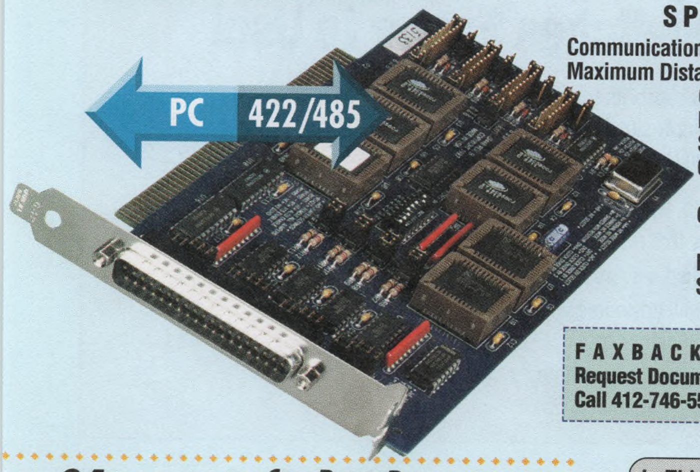
RS-422/485 Serial Interface Plus, 4-Port

Control RS-485 Devices from Windows.

- **No special drivers required.**
- **Compatible with all versions of Windows, including Windows NT™.**
- **Automatically enables and disables driver and receiver.**
- **Extra-large 64K buffer helps keep the PC's processor from getting bogged down.**
- **Connect up to 31 RS-485 devices per port.**
- **Supports both RS-485 and RS-422.**
- **Speeds up to 460.8 Kbps.**
- **Distances up to 4000 ft.**
- **Nine IRQ settings to choose from.**



SPECIFICATIONS

Communication Chip — 16750 UART
Maximum Distance — 4000 ft. (1219.2 m)
Operation — 2- or 4-Wire
Protocol — Asynchronous
Speed — Up to 460.8 Kbps
CE Approval — All items listed are approved
Connectors — (1) DB37M, (4) DB9M on included cable
Power — From PC Bus
Size — Half-card

FAXBACK INFORMATION
Request Document Number: 19417
Call 412-746-5500 Anytime

Link a PC running Windows®, DOS, or OS/2® to your industrial RS-422/485 hardware. Control up to 31 other devices per port from your PC at up to 4000 feet (1219.2 m) from the shop floor. Your PC reads the Interface Card as an RS-232 port, eliminating all communications roadblocks and incompatibility lockups. The extra-large 64K buffer prevents system slowdowns. And unlike external converters that limit you to RS-232 speeds, this card provides RS-422's high speeds and noise immunity.

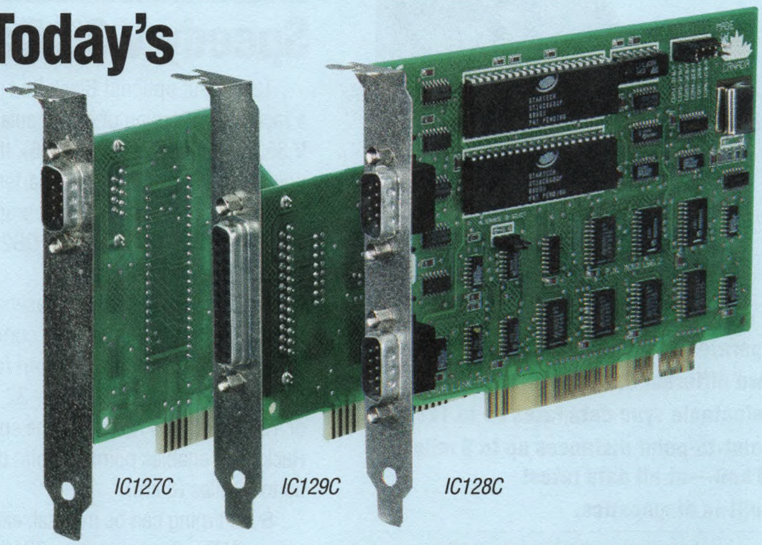
Item	Code	Price
RS-422/485 Serial Interface Plus, 4-Port	IC058C	**$479.00**
remember to order cables Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned, PVC	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		
Modular Thumbscrew Adapter Kit DB9 (F)↔RJ-45 (F) (8-wire)	FA756	**$9.95**

In This Section...
Cables/Connectors
Equipment Protection/Testers
Switches

PC Plus Adapters

Take Full Advantage of Today's Super-Fast Peripherals.

- **Three new I/O Cards featuring the 16650 UART Chip.**
- **Integrated 32-byte FIFO buffer for faster throughput.**
- **Serial models are 100% compatible with all V.34 external modems and all ISDN external terminal adapters.**
- **The PC Plus Enhanced Parallel Adapter supports both Enhanced Capabilities Port (ECP) and Enhanced Parallel Port (EPP) standards.**


IC127C *IC129C* *IC128C*

If you have an older computer—even last year's—chances are your parallel and serial ports can't keep up with today's super-fast peripherals. Your computer may actually be slowing down your modem or your printer. But these I/O Cards feature the 16650 UART chip with an extra-large 32-byte FIFO buffer for maximum throughput.

PC Plus RS-232 Serial Adapter

The ISA Card with serial port is totally compatible with all V.34 external modems and ISDN external terminal adapters. It's configurable as COM 1 through COM 4 using an IRQ of 2/3/4/5/10/11/12/15. Drivers for Windows® 95 and Windows NT™ are included.

PC Plus Dual Serial PCI Adapter

For those of you who have no extra ISA ports but still have spare PCI ports, we offer a PCI card with two high-speed serial ports. It uses PCI shared interrupt structure, virtually eliminating IRQ conflicts and is 100% compatible with all 56K external modems and ISDN terminal adapters. Drivers for Windows 95 and Windows NT are included.

FAXBACK INFORMATION
Request Document Number: 19424
Call 412-746-5500 Anytime

PC Plus Enhanced Parallel Adapter

Now your PC can send data as fast as your new parallel printer can print it! This ISA Card features an ultra-fast Enhanced Parallel Port with a maximum transfer rate of *2.5 MBps.*

The Enhanced Parallel Adapter supports both Enhanced Capabilities Port (ECP) and Enhanced Parallel Port (EPP) standards. You can configure it as LPT1 through LPT6, using IRQs 2/3/4/5/7/10/11/12, DMA1/3. The Adapter supports hexadecimal addresses 03BC, 0378, 0278, 0238, 0288, and 0338.

The Adapter is backward compatible with 4-bit and 8-bit (bidirectional) parallel ports and requires no special drivers.

SPECIFICATIONS

System Requirements — IBM PC or compatible with Windows 95 or Windows NT
Speed — IC127C–IC128C: 460.8 Kbps; IC129C: 2.5 MBps
CE Approval — All items listed are approved
Connectors — IC127C: (1) DB9; IC128C: (2) DB9; IC129C: (1) DB25
Power — From PC bus
Card Type — IC127C, IC129C: ISA; IC128C: PCI
Size — ¾ Card

Item	Code	Price
PC Plus Adapters		
RS-232 Serial	IC127C	**$69.00**
Dual Serial PCI	IC128C	**$149.00**
Enhanced Parallel	IC129C	**$49.00**

remember to order cables

For serial modem connections, order:
AT® Modem Cable 6-ft. (1.8-m)
EVMBMC-0006 **$17.95**
For other lengths, see p. 109.

For parallel printer connections, order:
Enhanced Parallel Port Cable, 10-ft. (3.0-m)
(2) DB25M Centronics Connectors
EQN202-0010 **$37.00**
For other lengths and genders, see p. 107.

Black Box Explains...

High-Speed Serial I/O.

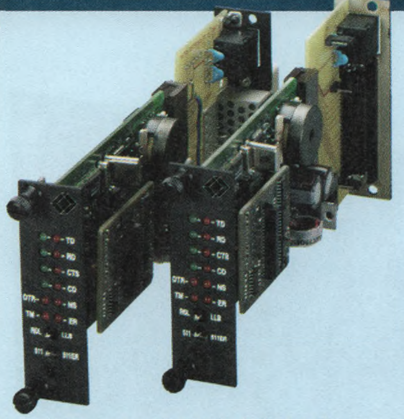
If you're not getting the performance you expect from your new high-speed modem or ISDN terminal adapter, it may be the fault of your PC's serial port. Serial ports on older PCs (even last year's!) just can't handle the speeds demanded by today's high-speed equipment.

The speed of a serial port is dependent on the type of UART (Universal Ansynchronous Receiver Transmitter) chip it uses. Older Pentium® PCs usually have serial ports based on the 16550 UART chip which are limited to 115.2 Kbps and have a 16K buffer. Because of the limited buffer that causes frequent buffer overflows and retransmission of entire blocks of data, the highest actual speed these chips can achieve is in the neighborhood of 80 Kbps. (And most 486 PCs have I/O chips that are *even slower* than that!)

While 16550 UARTs are fine for handling the demands of older, slower modems, they just can't keep up with today's high-speed 28.8- and 56.6-Kbps modems and can't begin to touch 128-Kbps ISDN speed. For that, you need a faster serial port—a serial port based on the 16650 UART.

Unlike the 16550 UART, the 16650 UART supports data-transfer rates up to 460.8 Kbps. And its robust 32K buffer helps to ensure that high data rates can be maintained without speed-dampening buffer overflows.

Fortunately, even if your PC has a 16550 or older UART serial port, it's easy to update to the newer 16650 with the simple addition of an inexpensive serial adapter card.



2-Wire Modular Campus Driver Rack Card, V.35

Speedy V.35 Campus Drivers—Rack 'em Up!

- **Operates over a single twisted pair.**
- **Two different Cards for V.35.**
- **Selectable sync data rates up to 128 Kbps.**
- **Point-to-point distances up to 5 miles (8 km)—at all data rates!**
- **Built-in diagnostics.**

FAXBACK INFORMATION
Request Document Number: 18203
Call 412-746-5500 Anytime

Talk about options! Black Box now offers a rackmount version of our popular 2-Wire V.35 Campus Driver (**page 385**). It's perfect for universities, corporate headquarters, airports—any site that covers a wide geographical area. And it's available with either a DB25 or 34-Pin M-Block connector.

The V.35 Rack Card is a baseband modem that supports full-duplex sync communications over a twisted pair. Choose from four sync data rates in all clock modes—32, 56, 64, or 128 Kbps. And no matter the speed, the Rack Card enables point-to-point distances up to 5 miles (8 km).

Sync timing can be internal, external, or received. The Card also uses 2B1Q modulation like its standalone version so it's compatible with leased lines offered by most carriers.

You also get built-in diagnostics like remote digital loopback, local line loopback, and a V.52 BERT test pattern generator and detector. Evaluate network conditions without the cost of external testing equipment. What a money saver!

SPECIFICATIONS

Clocking — Internal, external, recovered
Maximum Distance — Up to 5 mi. (8 km)
Operation — Full-duplex
Protocol — Sync
Speed — Up to 128 Kbps
CE Approval — All items listed are approved
Interface — V.35

Item	Code	Price
2-Wire Modular Campus Driver Rack Card, V.35		
DB25	ME485C-35/A	**$695.00**
34-Pin M-Block	ME485C-35/B	**$695.00**
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

For other lengths or genders, see p. 89.

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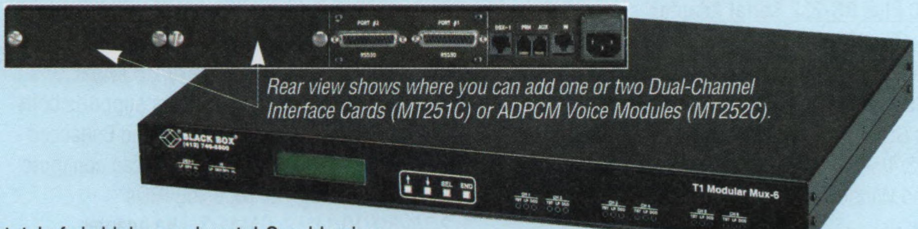
T1 Modular Mux-6 • Dual-Channel ADPCM Voice Module

Combine Data and Voice over T1 with This Expandable Mux.

- **Interfaces available for V.35 or RS-530.**
- **Add up to 2 hot-swappable Dual-Channel Interface or ADPCM Voice Modules for a total of 6 serial ports.**
- **Built-in SNMP management.**



Rear view shows where you can add one or two Dual-Channel Interface Cards (MT251C) or ADPCM Voice Modules (MT252C).

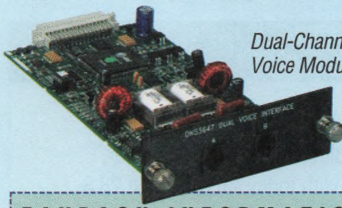
Split up your T1 bandwidth more effectively—use it for data *and* voice!

The T1 Modular Mux-6 has a built-in T1 ESF CSU, a high-speed serial port for V.35 or RS-530, and a DSX-1 port to hook up to a voice PBX or channel bank. Operate at speeds all the way up to 1.536 Mbps.

Two slots can fit two optional Dual-Channel Interface or ADPCM Voice Modules. The MT251C support V.35, RS-530, and RS-232. Add two for a total of six high-speed ports! Or add voice capabilities to your Mux with our Voice Modules. Compress 64-Kbps voice to 24 Kbps!

The Mux has an easy-to-use, on-screen user interface. Local and remote network interface loopbacks can be initiated from the front panel. And built-in error-rate testers save the cost of external testing equipment.

Outages or problems are also easily addressed. Whenever the Mux detects an alarm, it directs the integral modem to dial your control center or send Alarm Traps to your SNMP network manager.



Dual-Channel ADPCM Voice Module (MT252C).

FAXBACK INFORMATION
Request Document Number: 18973
Call 412-746-5500 Anytime

SPECIFICATIONS

Speed — N x 56/64 up to 1.536 Mbps
Interface — MT250A-35: (2) V.35, (1) DSX-1; MT250A-530: (2) RS-530, (1) DSX-1; MT251C–MT252C: (2) V.35, RS-530, or RS-232 (software-selectable)
Connectors — MT250A-35: (2) M34 F, (2) RJ-45, (2) RJ-11; MT250A-530: (2) DB25 F, (2) RJ-45, (2) RJ-11; MT251C–MT252C: (2) DB25 F
Power — 90–230 VAC, 47–63 Hz
Size — 1.8"H x 17"W x 10"D (4.6 x 43.2 x 25.4 cm)

Item	Code	Price
T1 Modular Mux-6		
V.35	MT250A-35	**$2395.00**
RS-530	MT250A-530	**$2395.00**
Dual-Channel Modules		
Interface	MT251C	**$795.00**
ADPCM Voice Module	MT252C	**$675.00**
remember to order cables V.35 Cable	EYN450-0006-MM	**$77.95**

For other lengths and genders, see p. 89.

Item	Code	Price
RS-530 Cable	EVN530-0010-MM	**$41.95**

For other lengths and genders, see p. 88.

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MicroRACK Power Supplies

More MicroRACK Power!

CE Approval — All items listed are approved

12-VDC MicroRACK Power Supplies (PS463A)

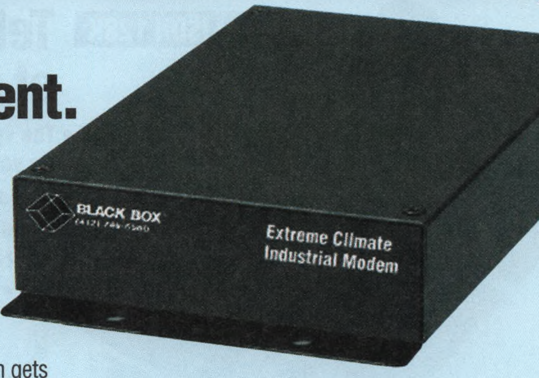
Now you have a greater choice of DC power sources for your MicroRACK (**pages 378–379**). Our 12- and 24-VDC MicroRACK Power Supplies support up to 16 Rack Cards.

Item	Code	Price
MicroRACK Power Supplies		
12-VDC	PS463A	**$400.00**
24-VDC	PS462A	**$400.00**

In This Section...
Cables/ Connectors
Equipment Protection/ Testers
Switches

Extreme-Climate Industrial Modem

A Modem that's Never out of Its Element.

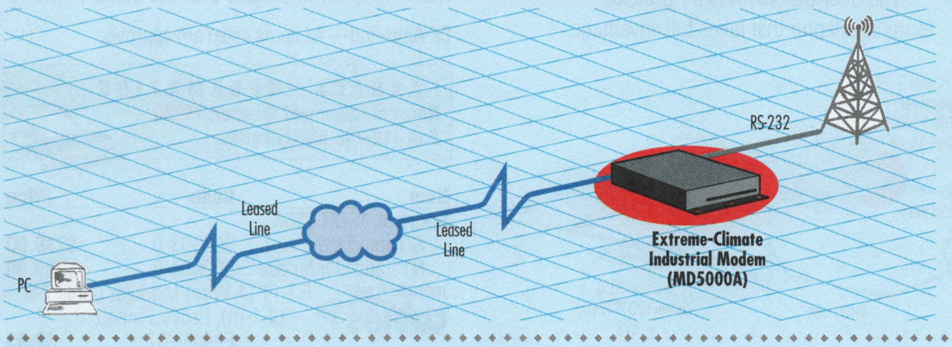


- **Durable metal enclosure protects circuitry from all weather extremes.**
- **Speeds up to 9600 bps.**
- **Saves the cost of replacing modems season after season.**

Ah, the great outdoors. The change of seasons. If you use desktop modems to monitor field conditions and they're exposed to the elements, hardware breakdown can happen at any time.

You need the BLACK BOX® Extreme-Climate Industrial Modem for durability, reliability, and savings. It can stand up to some of the harshest extremes of nature: blistering summer heat…deep winter chills…and freeze/thaw cycles that play havoc with an ordinary modem's circuits.

The Extreme-Climate Industrial Modem gets your data through—no matter the weather—at up to 9600 bps. And it will save you the cost of replacing desktop modems season after season.



FAXBACK INFORMATION
Request Document Number: 19338
Call 412-746-5500 Anytime

Item	**Code**	**Price**
Extreme-Climate Industrial Modem	MD5000A	**$1095.00**
AT® Modem Cable Custom Lengths	EVNBMC	**$16.15 + $.44/ft.**

remember to order cables

For specific lengths, see p. 109.

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Industrial Modem 288

Our Popular Industrial Modem Now Sends Data up to 28.8 Kbps—No Matter How Extreme the Conditions.

- **Durable metal enclosure wards off signal-disrupting EMI/RFI signals.**
- **V.34 trellis encoding, error correction, and data compression support throughput rates up to 57.6 Kbps.**
- **Operates via dialup or leased phone lines. Or hardwire it as a point-to-point line driver for links up to 20 miles (32 km) away.**
- **Steel bolt-mount flange anchors the Modem for use in rough industrial settings.**
- **Modules for 2- or 4-wire RS-485 interfaces.**

How reliable is your 28.8 dialup modem? Can it endure abuse from environmental extremes and signal interference? It can if it's the BLACK BOX® Industrial Modem 288!

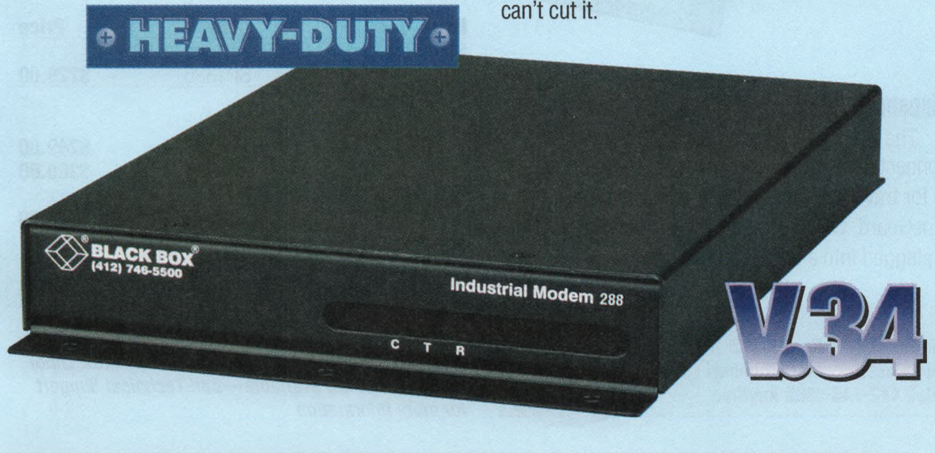
The durable design of the Industrial Modem 288 supports communications in otherwise intolerable applications. Fluorescent lights, elevator motors, nearby generators, and air-conditioning compressors all emit electromagnetic interference. But this Modem endures all—even temperatures from -10° to +60° Celsius. It's the smart choice when other modems can't cut it.

It's perfect for use in remote process-control or data-acquisition applications where you need a standalone device to ensure throughput. Use it to monitor activity at utility substations, military or agricultural installations, manufacturing plants—anywhere ordinary modems can't go.

It's ideal for long links, too. Send data via leased or dialup lines. Or use it hardwired as a line driver for point-to-point connections up to 20 miles (32 km) away.

Remote alarm-conditions dialing and auto connect/reconnect make it easy to manage the Industrial Modem 288 from a central site—and that means you can greatly reduce expensive service calls.

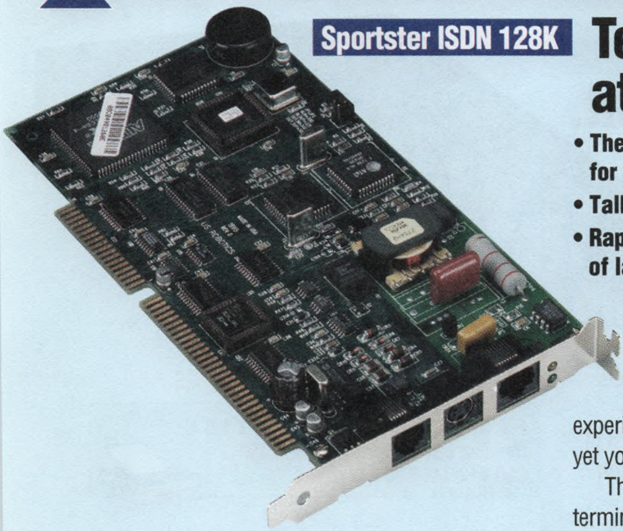
HEAVY-DUTY



FAXBACK INFORMATION
Request Document Number: 15743
Call 412-746-5500 Anytime

Item	**Code**	**Price**
Industrial Modem 288	MD3400A	**$695.00**
RS-485 Modem 144/288 Modules		
2-Wire	MD3315	**$125.00**
4-Wire	MD3316	**$125.00**
DB25 EDQ Shielded Cable, 5-ft. (1.5-m)		
M/M	EBN25C-0005-MM	**$32.95**
M/F	EBN25C-0005-MF	**$32.95**

remember to order cables



Sportster ISDN 128K

Telecommuters: Talk and Transfer Data at the Same Time!

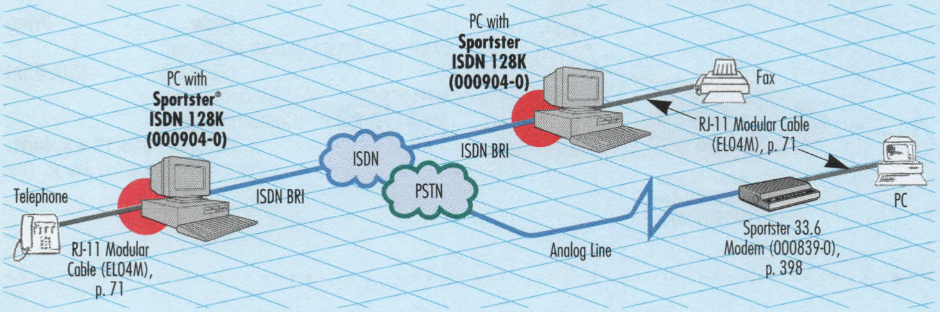
- **The speed and bandwidth of ISDN for your home- or small-office PC.**
- **Talk and send data simultaneously.**
- **Rapid downloads and transfers of large files and graphics.**
- **Available with or without NT1 integration.**

With the new U.S. Robotics® Sportster® ISDN 128K Modem from Black Box, you'll experience swift Internet access from home—yet you'll swear you're in the office.

The Sportster ISDN is a PC-based terminal adapter that takes full advantage of ISDN's large bandwidth. It connects to an ISDN Basic Rate Interface (BRI) and enables simultaneous voice and data communications.

Two internal cards are available for PCs with an ISA/EISA interface. Model 000903-0 comes with an S/T interface for use with an external NT1. The second card, Model 000904-0, has an integrated NT1 and U interface for a complete ISDN connection.

Equipped with an RJ-11 jack, the Sportster ISDN can be used with a standard telephone or fax machine to communicate over the digital network.


PC with
Sportster®
ISDN 128K
(000904-0)
Telephone
RJ-11 Modular Cable (EL04M), p. 71
ISDN BRI
ISDN
PSTN
PC with
Sportster
ISDN 128K
(000904-0)
ISDN BRI
Fax
RJ-11 Modular Cable (EL04M), p. 71
PC
Analog Line
Sportster 33.6 Modem (000839-0), p. 398

CE Approval—All items listed are approved

FAXBACK INFORMATION
Request Document Number: 19280
Call 412-746-5500 Anytime

Item	Code	Price
Sportster ISDN 128K		
S/T Interface	000903-0	**$239.00**
NT1 and U Interface	000904-0	**$239.00**
RJ-11 (4-Wire) Modular Cable 7-ft. (2.1-m), Cross-Pinned	EL04M-07	**$2.95**

For other lengths and pinnings, see p. 71.

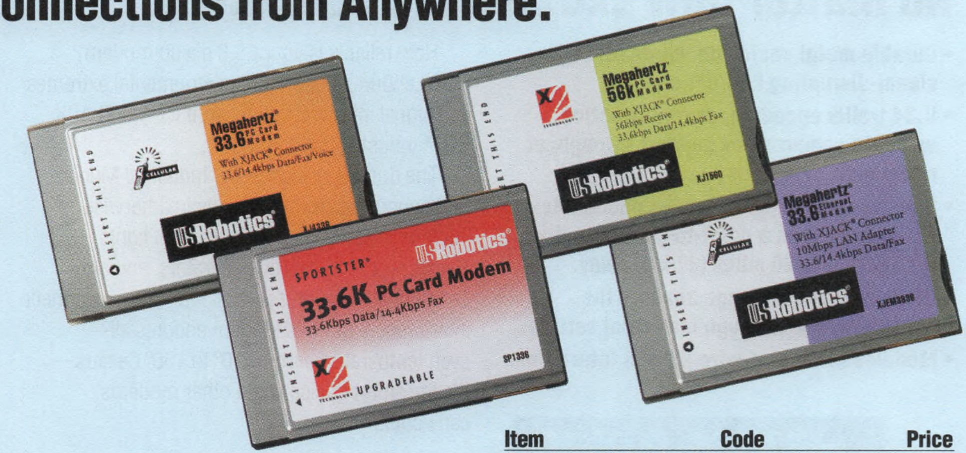
◆ ◆ ◆

Sportster and Megahertz PC Cards

Clear, Easy, and Fast Connections from Anywhere.

- **Compatible with most popular notebook PCs.**
- **Includes data/fax software for Windows.**
- **Sportster 33.6 is upgradable to x2—and Megahertz 56K downloads twice as fast as V.34!**
- **Megahertz 33.6 connects to cellular phones. (One version even connects to both a 10BASE-T LAN and cellular.)**

Black Box carries these reliable PC cards from U.S. Robotics because they fit the way people work today—on the road, at the office, or at home. And to help you manage faxes effortlessly, easy-to-use Windows® data/fax software is included.


Megahertz® 33.6 PC Card Modem
With XJACK® Connector 33.6/14.4kbps Data/Fax/Voice
U.S.Robotics
Megahertz 56K PC Card Modem
With XJACK® Connector 56kbps Receive 33.6kbps Data/14.4kbps Fax
U.S.Robotics
XJ1560
SPORTSTER® 33.6K PC Card Modem
33.6Kbps Data/14.4Kbps Fax
U.S.Robotics
UPGRADEABLE
SP1336
Megahertz® 33.6 Ethernet Modem
With XJACK® Connector 10Mbps LAN Adapter 33.6/14.4kbps Data/Fax
U.S.Robotics
XJEM3336
INSERT THIS END

Sportster PC with DataView

Get the speed of the desktop Sportster 33.6K in a PC card with reliable remote service, and compatibility with many popular notebook PCs. And the Sportster 33.6 PC Card is upgradable to x2. So you can download e-mail, critical business information, and large files—all at speeds up to 56 Kbps—while you're on the go!

The DataView™ feature provides diagnostics at a glance—LED indicators instantly provide power, send, receive, and online status.

Megahertz PC Cards with XJACK Connector

The XJACK Connector pops out for easy connection to a standard phone cord, then pops in for travel. Megahertz® Cards also feature Digital LineGuard, which protects them from damage if plugged into a digital PBX phone line.

FAXBACK INFORMATION
Request Document Number: 18241
Call 412-746-5500 Anytime

Item	Code	Price
Sportster 33.6 PC Card (x2 Upgradable)	SP1336	**$229.00**
Megahertz PC Card		
33.6 (Cellular with XJACK)	XJ4336	**$249.00**
56K	XJ1560	**$269.00**
33.6 (Cellular and 10BASE-T)	XJEM3336T	**$349.00**
Cell Cable (Motorola® MicroTAC®)	52683	**$34.95**

Cell Cable connects the XJ4336 Card to your cellular phone. It supports a wide variety of Motorola MicroTAC, Pioneer®, and JVC® cellular phones. Other phone cables are available—call Technical Support for more information.

800 Series ConferenceLink Telephones

The Conferencing Power of Big Business for Your Desktop or Small Meeting Room.

- **Full-duplex audio delivers smooth-flowing, two-way conversations.**
- **Connect to your PC's full-duplex sound card for desktop videoconferencing and Internet voice calls.**
- **360° coverage so everyone can be heard.**
- **Any-key answer, volume control, and mute key functions.**
- **Easy set-up.**

Give your home office or small company the conferencing power of a big business with U.S. Robotics® 800 Series ConferenceLink™ Telephone.

The CS850, CS870-N, and CS870-S phones deliver full-duplex audio for smooth, two-way conversations. And they make videoconferencing or Internet voice calls accessible to a wider range of business consumers who want to upgrade their offices affordably.

They're perfect for small conference rooms that seat three to five people. Echo cancellation technology and 360° coverage enables everyone in the room to be heard.

ConferenceLink phones are great for home offices, too. Put one on your desktop and your hands are free to do other work while you talk.

The phones are easy to set up—no DIP switches or user-tuning required! All three phones feature any-key answer, volume control, and a mute key.

For analog phone systems, choose CS850. For Northern Telecom® digital PBX systems, select CS870-N. And for Siemens® ROLM® digital PBX systems, choose CS870-S.

Both PBX-compatible models plug directly into the phone system without any complicated or expensive installation procedures.

FAXBACK INFORMATION
Request Document Number: 18935
Call 412-746-5500 Anytime

Item	Code	Price
800 Series ConferenceLink Telephones		
CS850	CS850	**$299.00**
CS870-N	CS870-N	**$599.00**
CS870-S	CS870-S	**$599.00**

1000 Series ConferenceLink Telephones

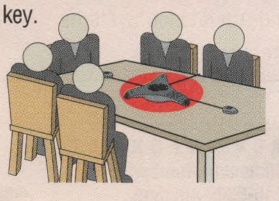
High-Quality Conference Telephones that Beat All Other Speakerphones—Hands Down.

ConferenceLink Extension Mics

If your conference table is longer than 13 feet, or if you have a large conference room, you need a pair of ConferenceLink Extension Microphones.

Simply attach them to your CS1050, CS1055, or CS1075 and everyone will be heard loud and clear—even those people farthest from the ConferenceLink.

Each Microphone has a 6-ft. cord and a mute key.



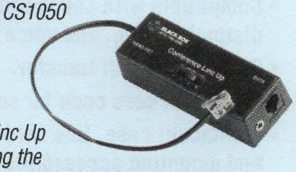
Item	Code	Price
ConferenceLink Extension Mics		
for CS1050	XM1000	**$49.00**
for CS1055, CS1075	XM1005	**$49.00**

FAXBACK INFORMATION
For 1000 Series ConferenceLink & Extension Mics: 18928
Call 412-746-5500 Anytime

- **Professional full-duplex speakerphone provides two-way conversation without clipped words.**
- **Ideal for 360° in medium to large conference rooms—even for Internet voice calls and videoconferencing.**

The ConferenceLink CS1050, CS1055, CS1075-N, and CS1075-S handle more than just regular conference calls, whether your phone system is analog *or* digital PBX. All four phones are easy to set up and feature any-key answer, volume control, and mute keys. But that's not all!

360° Coverage



Conference LInc Up! *For only $139.00, connect the CS1050 to a digital phone system—see the Conference Linc Up (MC117A),* ***p. 416****.* *For the Conference Linc Up Solution Pak, including the ConferenceLink phone and the Linc Up, see* ***p. 52****.*

Experience hands-free, full-duplex audio for videoconferencing by connecting a ConferenceLink phone to the sound card in your PC/desktop videoconferencing system. Or make full-duplex Internet or corporate intranet voice calls while running Internet telephony software.

For analog phone systems, choose the CS1050 or CS1055 models. The CS1055 features automatic redial and programmable ring capabilities.

For Northern Telecom digital PBX systems, select the CS1075-N. And for Siemens ROLM digital PBX systems, choose model CS1075-S. Both PBX-compatible models plug directly into the phone system without a digital adapter, analog interface card, or separate analog line.

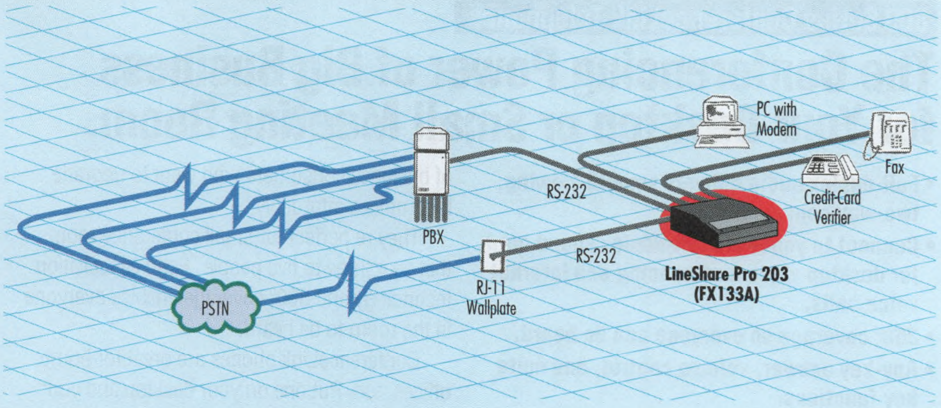
Item	Code	Price
1000 Series ConferenceLink Telephones		
NEW LOW PRICE! $ CS1050	CS1050	**$369.00**
CS1055	CS1055	**$399.00**
CS1075-N	CS1075-N	**$699.00**
CS1075-S	CS1075-S	**$699.00**

Commercial LineShare Pros

When Money Is on the Line, Our Commercial LineShare Pros Come through with HUGE Savings for You!

- **For small, medium, and large offices.**
- **Attach three or four devices.**
- **Connect to one or two phone lines.**
- **Power- and telephone-line surge protection.**
- **Compatible with call waiting, Caller ID, distinctive ring, and voice mail.**
- **Port-to-port call transfer.**
- **Remote access code for security.**
- **Wallmount case, line cord guides, and mounting accessories included.**

Designed for heavy-duty commercial use, the BLACK BOX® Commercial LineShare Pros offer powerful, technically advanced programmable features for custom applications for any size office.



Our Commercial LineShare Pros are compatible with several telephone-company services that your business relies on: call waiting, Caller ID, distinctive ring, and voice mail. For security, the LineShare Pros feature a remote access code to keep hackers and spies out. *Plus* each LineShare Pro is equipped with power- and telephone-line surge protection. Talk about products with the Black Box Advantage!

Commercial LineShare Pros connect directly to the demarcation or telephone-extension outlet. A wallmount case, line-cord guides, and mounting-accessories kit are included with each LineShare Pro. Installation is quick, clean, and easy.

LineShare Pro 102

Up to three devices can share one phone line with LineShare Pro 102—telephones, modems, faxes, credit-card verifiers, even PBXs! LineShare Pro 102 has 34 programmable features. It's perfect for home offices and small or mid-size business offices.

LineShare Pro 103

Mid-size offices or larger will appreciate the 40 programmable features of LineShare Pro 103. It's ideal for businesses with point-of-sale terminals and security alarm and monitoring systems. Up to four devices can share a single phone line.

LineShare Pro 203

Large offices will find a workhorse in our new LineShare Pro 203. Up to four connected devices can share one or two phone lines, and that flexibility is perfect for applications like time and attendance systems, flow-monitoring systems—anything heavy-duty. LineShare Pro comes with 46 programmable features.

LineShare Pro 102
BLACK BOX
(412) 746-5500
POWER

It's tailor-made for your line of work. LineShare Pro 102 has 34 programmable features!

Applications for the Commercial LineShare Pros:

- Credit-Card Authorization Terminals
- Point-of-Sale Terminals
- Security-Alarm and Monitoring Systems
- Remote-Diagnostic Systems
- Money-Order Dispensing Systems
- Energy-Management Systems
- Bulletin-Board Systems
- Flow-Monitoring Systems
- Call Diverters
- Time and Attendance Systems
- Fluid-Storage Systems

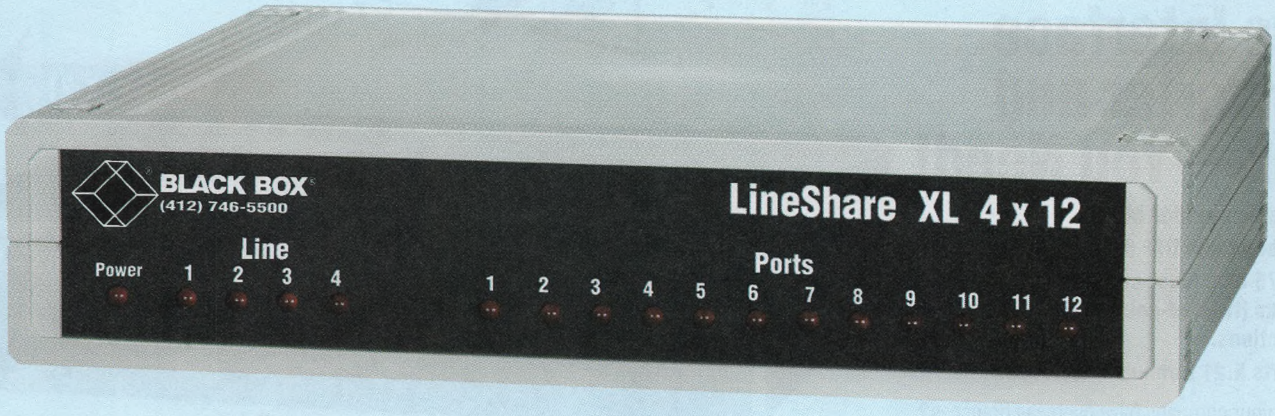
FAXBACK INFORMATION
Request Document Number: 19345
Call 412-746-5500 Anytime

Item	Code	Price
Commercial LineShare Pro		
102	FX131A	**$189.95**
103	FX132A	**$224.95**
203	FX133A	**$249.95**
remember to order cables RJ-11 (4-Wire) Modular Cable, 7-ft. (2.1-m) Straight-Pinned	EL04MS-07	**$2.95**

For other lengths and pinnings, see p. 71.

Programmable and Nonprogrammable Commercial LineShares

Dedicate Lines for Individual Users, Share Other Lines for Multiple Devices—Simultaneously.



- **Place up to 12 devices on four lines. For even greater savings, place up to 24 devices on eight lines.**
- **Available in Programmable and Nonprogrammable versions.**
- **Flexible! With Programmable models, you can dedicate individual lines to single devices and share other lines for multiple devices.**
- **Support all telephone-line connections.**
- **Protect against crashed Internet connections.**
- **Connected devices can function even during power outages.**
- **Easy to install.**

Save on line costs like *never before* and have the flexibility to dedicate and share lines, too!

Nonprogrammable LineShares.

Connect up to three devices to a single phone line. All three devices exclusively share the line on a first-come, first-served basis.

Programmable LineShares.

Dedicate individual devices to individual lines and have the remaining devices share the remaining lines. No other phone-line sharer offers this much flexibility for so many devices!

Ready, Set, Go!

Our Commercial LineShares don't require any software. And installation is a breeze. Just connect your devices to a LineShare and plug in its AC transformer. Ready, set, go—it's just that simple.

What's Your Line?

The Commercial LineShares support all telephone-line connections—analog, ISDN, and Digital Subscriber Lines such as T1. So what's your line? The LineShares can work on it!

Never Experience a Bad Crash Again.

E-mail a document over one line and carry on a phone conversation on another line at the same time. Enjoy uninterrupted use of the lines so you get your work done. Crashed Internet connections are also eliminated by this lockout method.

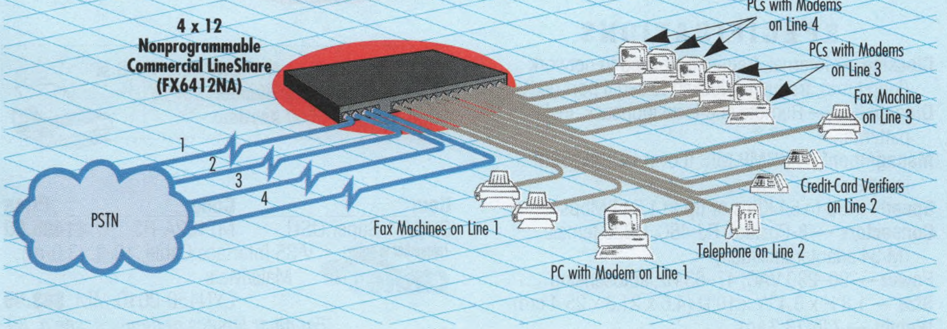
Power When You Need It.

The Power Failure Transfer feature provides a significant benefit to customers using a Commercial LineShare with a telephone system that is on an uninterruptible power supply.

Say the power goes out in the middle of a very busy workday. Sounds like disaster, right?

But if you have either a Nonprogrammable or Programmable Commercial LineShare, you're in luck.

If you have a 4 x 12 LineShare, as many as four devices can continue to function. And if you have a 8 x 24 LineShare, up to eight devices stay powered up.



FAXBACK INFORMATION
Request Document Number: 19352
Call 412-746-5500 Anytime

Item	Code	Price
Commercial LineShares		
Nonprogrammable		
4 x 12	FX6412NA	**$995.00**
8 x 24	FX6824NA	**$1995.00**
Programmable		
4 x 12	FX6412PA	**$1295.00**
8 x 24	FX6824PA	**$2495.00**
remember to order cables RJ-11 (6-Wire) Modular Cable, 7-ft. (2.1-m)	EL06MS-07	**$3.95**
For other lengths or pinnings, see p.71.		
DB9 Extension Cable, 5-ft. (1.5-m) Male/Female	EDN12H-0005-MF	**$19.95**
For other lengths or genders, see p.105.		

Micro NTU G.703↔X.21

Connecting to X.21? Here's the NTU—Plus Interface Converter and Mux—You Need!

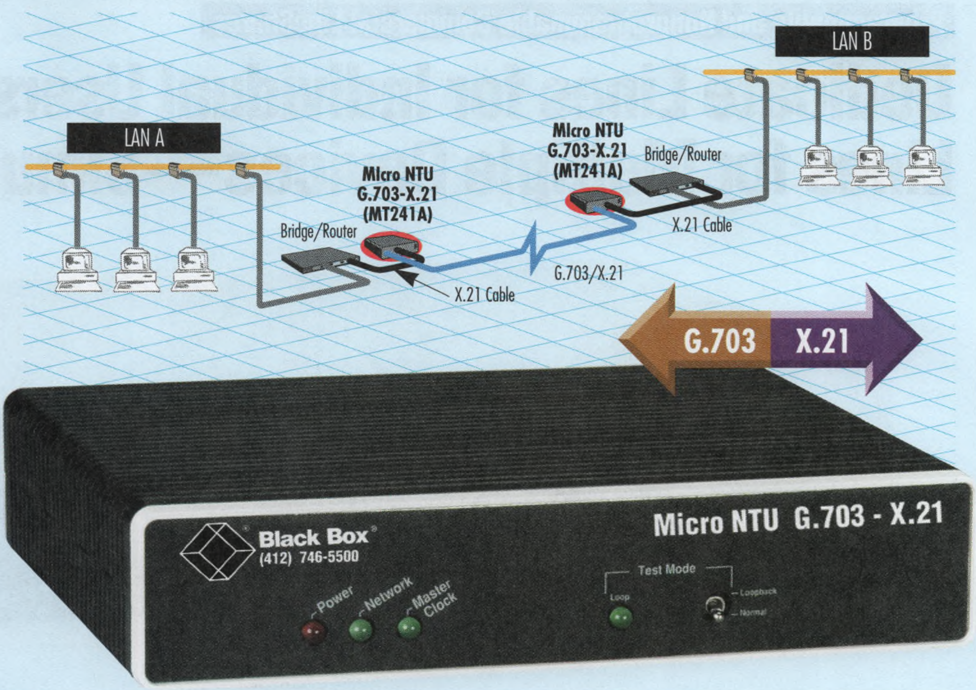
- **Data rates to 2.048 Mbps.**
- **Four selectable DTE data rates.**
- **Make 75-ohm (dual-coax) and 120-ohm (twisted-pair) network connections.**
- **Supports X.21 terminal interfaces.**

Does your company have overseas branches? Want to connect bridges and routers with X.21 interfaces to G.703 networks? Now you can! And with our new Micro NTU G.703-X.21, you get an NTU—plus an interface converter and mux!

As an NTU, the unit receives unstructured, synchronous 2.048-Mbps data from a G.703/X.21 network and sends it to a router, bridge, or mux.

You can also use the Micro NTU as an interface converter. It accepts either 75-ohm (dual-coax) or 120-ohm (twisted-pair) G.703 signals and converts them so X.21 equipment can read them.

You can also use the Micro NTU as a mux. Use it to connect slower devices to a 2.048-Mbps G.703/X.21 link.


LAN A
LAN B
Micro NTU G.703-X.21 (MT241A)
Bridge/Router
X.21 Cable
G.703/X.21
Micro NTU G.703-X.21 (MT241A)
Bridge/Router
X.21 Cable
G.703
X.21
Black Box (412) 746-5500
Micro NTU G.703 - X.21
Power
Network
Master Clock
Test Mode
Loop
Loopback
Normal

SPECIFICATIONS

Clocking — Internal, external, network (receive loop)
Diagnostics — Loopback
Speed — Network: 2.048 Mbps; Terminal: 256 Kbps, 512 Kbps, 1.024 Mbps, 2.048 Mbps
CE Approval — All items listed are approved
Interface — Network: G.703; Terminal: X.21
Indicators — (5) LEDs: power, network, master clock, loop, and loopback
Power — 115 VAC/60 Hz or 230 VAC/50 Hz, switch-selectable
Size — 7.3"H x 6.6"W x 1.6"D (18.5 x 16.8 x 4.1 cm)

FAXBACK INFORMATION
For Micro NTU G.703-X.21: 15970
For G.703 75–120 Adapter: 15987
Call 412-746-5500 Anytime

Item	Code	Price
Micro NTU G.703↔X.21		
AC	MT241A	**$1195.00**
For simple G.703 75–120-ohm conversion...		
G.703 75–120 Adapter (Specify Male or Female)	MT242A-M	**$75.00**
For more details, see page 432.		
HD26M/DB15M Adapter Cable		
M/M	EHN092-X21M	**$49.95**
F/F	EHN092-X21F	**$49.95**
See our other NTU on p. 434.		

remember to order cables

◆ ◆ ◆

Now with MORE front-panel programming features!
BLACK BOX (412) 746-5500
DDS/T1 Super DSU
Network
SEL
END
Serial Port

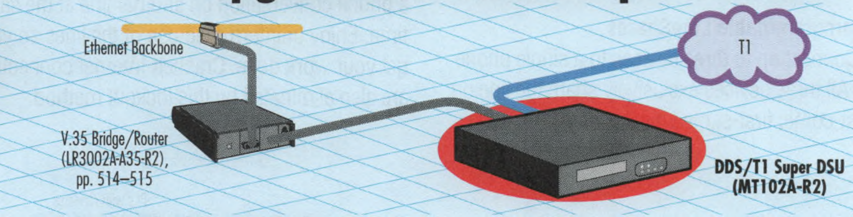
DDS/T1 Super DSU

Connect to 56-Kbps DDS Now, Upgrade to 1.544-Mbps T1 Later.

- **Both a complete 56/64-Kbps DDS CSU/DSU *and* a T1 ESF CSU/DSU.**
- **Complete SNMP management.**

Use the DDS/T1 Super DSU for a 56-Kbps DDS line now—then use it for your high-speed T1 line when you upgrade. And since you can run a DDS or T1 line into Frame Relay, this CSU/DSU is perfect for Frame-Relay connections.

The DDS/T1 Super DSU is completely SNMP manageable. You can also diagnose and configure the CSU/DSUs with pushbuttons and an easy-to-read front panel or from any ASCII terminal.


Ethernet Backbone
T1
V.35 Bridge/Router (LR3002A-A35-R2), pp. 514–515
DDS/T1 Super DSU (MT102A-R2)

SPECIFICATIONS

Clocking — Internal, frequency locked to network (loop time), frequency locked to serial port (ext)
Diagnostics — Remote and local loopback, test patterns
Management — SNMP MIB II over UDP/IP/SLIP interface
Speed — Up to 64 Kbps or up to 1.544 Mbps
Connectors — 8-Position RJ-48C, DB25 female (M/34 adapter included)
Power — 90–230 VAC, 47–63 Hz, autosensing
Size — 1.8"H x 8.4"W x 10"D (4.6 x 21.3 x 25.4 cm)
Weight — 7 lb. (3.2 kg)

FAXBACK INFORMATION
Request Document Number: 16744
Call 412-746-5500 Anytime

Item	Code	Price
DDS/T1 Super DSU	MT102A-R2	**$1495.00**
V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**
For other lengths or genders, see p. 89.		

remember to order cables

T1/FT1 CSU/DSU

More for Your Money! This T1/FT1 CSU/DSU Is Rich in Features, Not in Price.

- **Packed with features, yet low in cost!**
- **Ideal for leased-line or Frame-Relay applications.**
- **SNMP for local or remote management.**
- **Telnet access for troubleshooting and remote diagnostics.**
- **Flash-memory upgradable.**
- **Plug-and-play installation.**
- **Available in Compact or Rackmount versions. Rack Cards and 16-Card Rack Chassis also available.**

BLACK BOX
(412) 746-5500
Compact T1/FT1 CSU/DSU w/SNMP
LINE
MONITOR
TX
RX
TX
RX
LOS/OOF
YEL
AIS
ERR
TEST
LLB
2047
RLB
2047/ERR
SYNC
DTE
CONTROL PORT
RS-232
POWER

So much in a CSU/DSU for so little!

These new BLACK BOX® T1/FT1 CSU/DSUs consolidate multiple features into a single product—and they provide compatibility with both new and existing equipment. They're perfect for your leased-line and Frame-Relay applications.

Better Management, Less Labor.

For efficient management, the T1/FT1 CSU/DSUs come with an SNMP agent for local and remote network management. To communicate with the SNMP agent, the units operate through an RS-232 serial connection with Point-to-Point Protocol (PPP).

You can also access the CSU/DSUs with any device that uses Telnet™—and that's extremely valuable for remote troubleshooting or monitoring and initiating diagnostics.

You get security, too. A password routine prevents unauthorized access.

Painless Diagnosis.

All our T1/FT1 CSU/DSUs feature built-in diagnostics. Each comes with a JAVA™ based SNMP management tool for monitoring all SNMP-enabled devices on your network.

The Compact CSU/DSU also features a front panel with LED indicators. Two toggle switches initiate local and remote loopbacks and generate data test patterns. In addition, four bantam jacks on the front panel enable you to isolate network problems on the T1 line.

Easy Configuration.

Installation is plug and play. And configuring units is just as quick and easy. Locally, you can configure the CSU/DSUs through their control ports via an RS-232 connection. From a central site, configure the units via Telnet or SNMP.

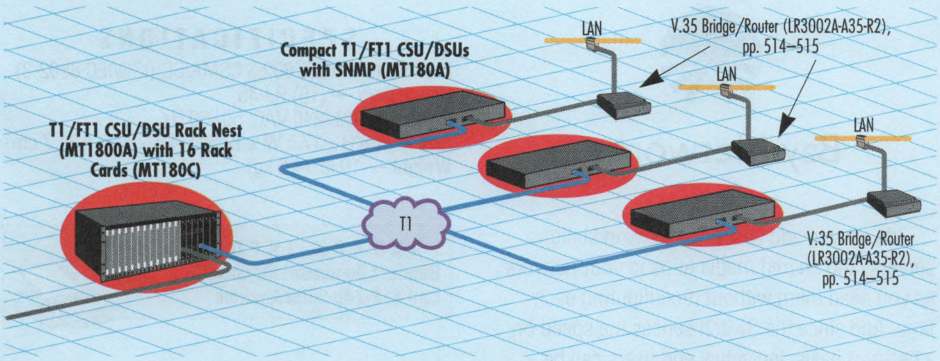
Ready for the Future.

Each CSU/DSU includes 512K Flash memory. Software upgrades are fast and easy from remote sites via a Telnet session. Locally, just upgrade through the control port.

Freedom of Choice.

We have the T1/FT1 CSU/DSU that's right for your network.

T1/FT1 CSU/DSUs are available as standalone Compact or Rackmountable units. You can also take advantage of the T1/FT1 CSU/DSU Rack Chassis. Populate it with up to 16 Rack Cards for maximum power, flexibility, and savings!


Compact T1/FT1 CSU/DSUs with SNMP (MT180A)
T1/FT1 CSU/DSU Rack Nest (MT1800A) with 16 Rack Cards (MT180C)
LAN
V.35 Bridge/Router (LR3002A-A35-R2), pp. 514–515
LAN
LAN
T1
V.35 Bridge/Router (LR3002A-A35-R2), pp. 514–515

SPECIFICATIONS

Clocking — Internal, main T1
Management — SNMP agent, TELNET over PPP
Maximum Speed — N x 56/64 up to 1.536 Mbps
Interface — Control and PPP Ports: RS-232; User Port: V.35
Connectors — Control and PPP Ports: DB9 female; T1 Port: 8-position RJ-48C; User Port: DB25 female
Power — 120 VAC
Size — MT180A: 1.8"H x 6.5"W x 9.8"D (4.4 x 16.5 x 24.9 cm); MT180RA: 1.7"H x 16.7"W x 9.1"D (4.4 x 42.4 x 23.1 cm); MT1800A: 7"H x 19"W x 10.1"D (17.8 x 48.3 x 25.7 cm)

FAXBACK INFORMATION
Request Document Number: 19369
Call 412-746-5500 Anytime

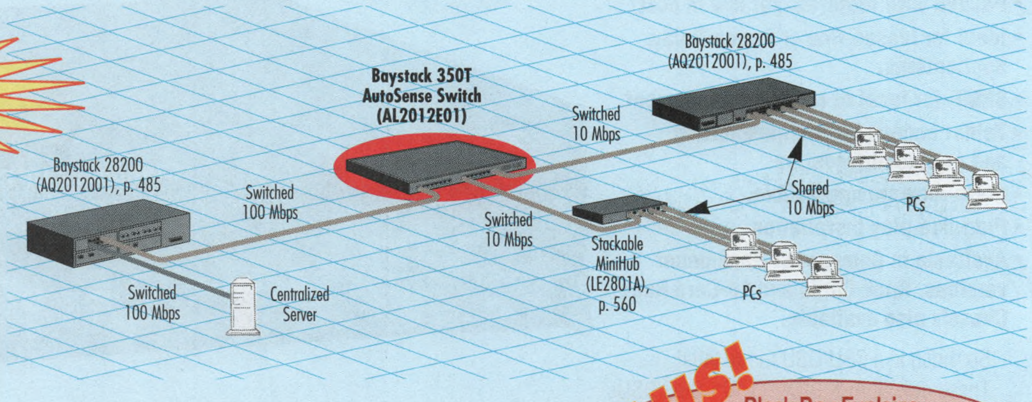
Item	Code	Price
T1/FT1 CSU/DSU		
Compact T1/FT1 CSU/DSU with SNMP	MT180A	**$1095.00**
Rackmountable T1/FT1 CSU/DSU with SNMP	MT180RA	**$1095.00**
T1/FT1 CSU/DSU Rack Card	MT180C	**$1095.00**
T1/FT1 CSU/DSU Rack Nest	MT1800A	**$1695.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83. Specify gender when ordering.		
V.35 Interface Cable, 10-ft. (3.0-m), Male/Male	EYN450-0010-MM	**$83.95**
For other lengths or genders, see p. 89.		

BayStack 350T Autosense Switch

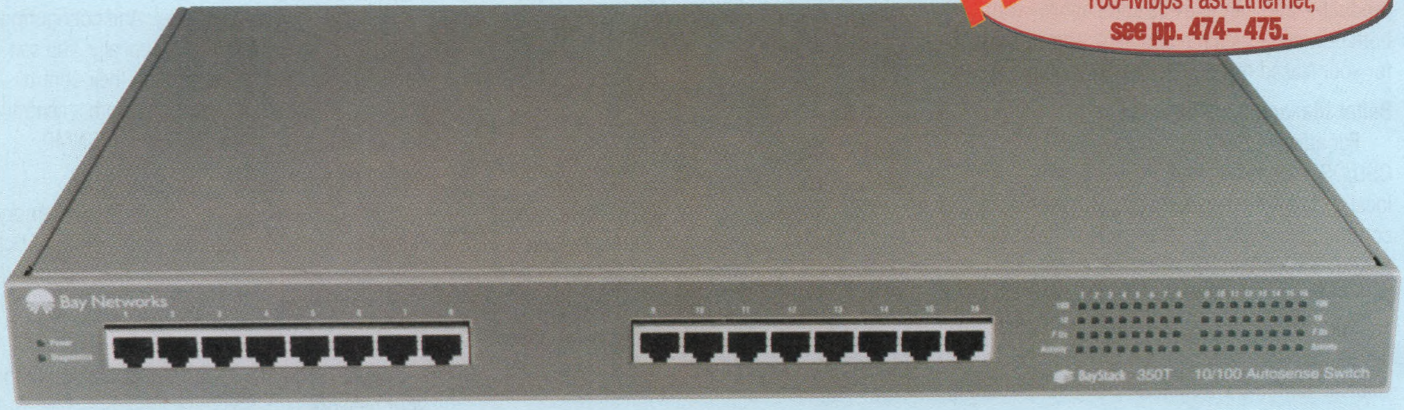
Support for 10 or 100 Mbps—Automatically. What Could Be Easier?

Autosensing!

Autosensing Enables You to Upgrade Your Network from 10 to 100 Mbps Gradually.


Baystack 28200
(AQ2012001), p. 485
Switched
100 Mbps
Switched
100 Mbps
Centralized
Server
Baystack 350T
AutoSense Switch
(AL2012E01)
Switched
10 Mbps
Stackable
MiniHub
(LE2801A),
p. 560
PCs
Switched
10 Mbps
Baystack 28200
(AQ2012001), p. 485
Shared
10 Mbps
PCs

PLUS! Black Box Explains 100-Mbps Fast Ethernet, see pp. 474–475.


Bay Networks
BayStack 350T 10/100 Autosense Switch

BayStack 350T; Front View

- **Offers 16 10-/100-Mbps autosensing ports.**
- **Low price-per port ratio.**
- **Provides best throughput for large multimedia files.**
- **Full-duplex operation on all ports.**

You plan to upgrade your growing 10-Mbps network to 100 Mbps, but you can't afford to upgrade the entire network right now. And there's no sense adding new 10-Mbps equipment if it will be outdated when you switch to 100 Mbps. What should you do?

The BayStack 350T Autosense Switch is the solution. With standards-based autonegotiation, the Autosense Switch supports 10- or 100-Mbps speeds on each port by automatically sensing the speed of the attached device. Just attach your 10- or 100-Mbps devices and the Switch will take care of the rest.

Bay Networks

It's easy to add Fast Ethernet workstations, servers, and shared media hubs to your network as you need them without reconfiguring each time. And since the Switch senses the speed on a per-port basis, individual end users can be upgraded at anytime.

This Switch has 16 RJ-45 modular connectors that support either 10BASE-T switched Ethernet transmissions over Category 3, Category 4, and Category 5 UTP cabling or 100BASE-TX switched Fast Ethernet transmissions over Category 5 UTP.

The Autosense Switch also has a serial port that supports console or out-of-band (OOB) management, Telnet™, BootP, and TFTP.

SPECIFICATIONS

Standards — IEEE 802.3 CSMA/CD (ISO/IEC 8802-3)
Connectors — (16) RJ-45
Power — 100–240 VAC, 50–60 Hz
Size — 1.8"H x 17.5"W x 12.5"D (4.5 x 44.2 x 31.7 cm)
Weight — 10 lb. (4.5 kg)

FAXBACK INFORMATION
Request Document Number: 17563
Call 412-746-5500 Anytime

Item	Code	Price
BayStack 350T Autosense Switch, 16-Port	AL2012E01	**$3995.00**
Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned, PVC	EYN737MS-0010	**$10.95**

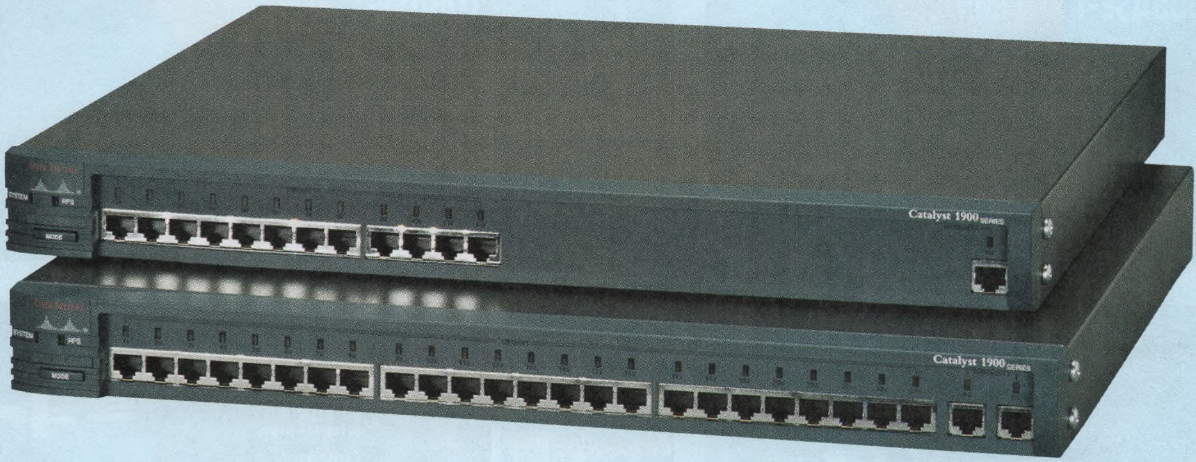
remember to order cables

For other lengths and pinnings, see p. 68.

Cisco Catalyst 1900 Series Ethernet Switches

The Perfect Low-Cost Option for Workgroup and Desktop Switching—and High-Speed Uplink Connections.

CISCO SYSTEMS
PARTNER
PREMIER RESELLER
PENNSYLVANIA



- **Collision-Free 100BASE-TX full-duplex operation delivers up to 200 Mbps throughput at distances up to 2 km.**
- **Supports SNMP, Telnet, RMON, and out-of-band management.**
- **Connection for a redundant power supply (RPS).**
- **Shared memory architecture with 3-MB packet buffer.**

Tired of the constraints and heavy traffic on your traditional shared LAN? With Cisco Catalyst 1900 Series Ethernet Switches, bottlenecks can be a thing of the past. What's more, you get all the benefits of a fully-switched network for the price of a hub.

Three fixed-port configurations are available:

- 24 switched 10BASE-T ports, 2 switched 100BASE-TX ports and 1 switched AUI port.
- 24 switched 10BASE-T ports, 1 switched 100BASE-TX port, 1 switched 100BASE-FX port and 1 switched AUI port.
- 12 switched 10BASE-T ports, 1 switched 100BASE-TX port and 1 switched AUI port.

The 1900 Series eliminates server bottlenecks. Just attach any or all of the switched 10BASE-T ports to individual workstations or 10BASE-T hubs and watch your data accelerate. Each device connected to a 10BASE-T port is guaranteed 10-Mbps of bandwidth.

Use the high-speed 100BASE-TX and 100BASE-FX uplink ports to support high-performance users and high-bandwidth applications. You can also use these UTP or fiber uplinks to connect to 100BASE-TX, FDDI, or future ATM server and backbone connections.

With support for IEEE 802.3 Spanning Tree Protocol (STP), you get redundant backbone connections and loop-free networks that improve fault tolerance and simplify network configuration.

FAXBACK INFORMATION
Request Document Number: 19297
Call 412-746-5500 Anytime

SPECIFICATIONS

CE Approval — All items listed are approved
Connectors — WS-C1900: (26) RJ-45, (1) DB15; WS-C1900C: (25) RJ-45, (1) fiber, (1) DB15; WS-C1912: (13) RJ-45, (1) DB15
Power — 100–240 VAC, 50–60 Hz
Size — 1.7"H x 17.5"W x 15.3"D (4.4 x 44.5 x 38.9 cm)
Weight — 10.5 lb. (4.8 kg)

Item	Code	Price
Cisco Catalyst 1900 Series Ethernet Switches		
(24) 10BASE-T Ports with (2) 100BASE-TX Ports	WS-C1900	**$3995.00**
with (1) 100BASE-TX and (1) 100BASE-FX Port	WS-C1900C	**$4495.00**
(12) 10BASE-T Ports with (1) 100BASE-TX Port	WS-C1912	**$2495.00**
remember to order cables Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned, PVC	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		
Duplex Fiber Optic Cable, SC-SC 1-m (3.2-ft.), Riser	EFN4025-001M	**$109.95**
For other lengths and applications, see p. 74.		

Do You Need an Ethernet Switch?

An Ethernet Switch is used for a variety of applications. If you:

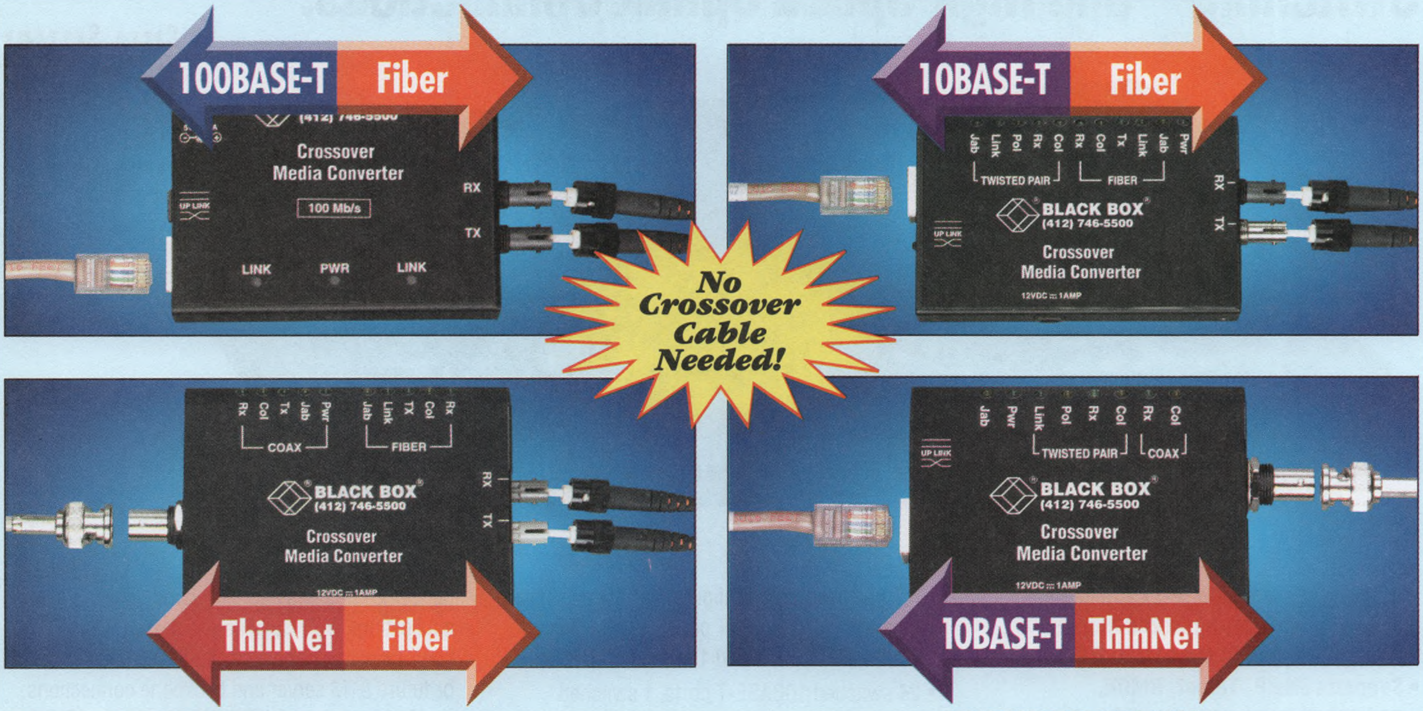
- need to reduce the traffic on your network,
- have two or more file servers on your network,
- want to share one server among workgroups,
- need to add a high-speed workgroup to your existing 10-Mbps LAN,
- plan to upgrade your 10-Mbps network to 100 Mbps, an Ethernet Switch can improve your network's performance.

To learn more about the benefits of Ethernet Switching, check out our entire Ethernet Switch product line on **pages 476–487**. You'll get the information you need to select the best switch for your network's applications. And if you still have questions call Tech Support.

Converters
Line Drivers
Modems, CSU/DSUs, & Muxes
LAN

Crossover Media Converters

Convert to Fiber without Crossover Cables.



Crossover Media Converters

- **Uplink switch eliminates crossover cables.**
- **Small, compact, lightweight design.**
- **Full complement of LEDs provide network link status on each port separately.**
- **Compatible with Ethernet V.10/2.0 specifications and complies with IEEE 802.3 standards.**

100-Mbps Models

- **Connect twisted-pair or BNC to fiber segments.**
- **Autosensing full- or half-duplex operation.**
- **Available with SC or ST fiber connectors.**
- **Distances up to 2 km in full-duplex fiber segments.**

10-Mbps Models

- **Connect twisted-pair segment with a BNC or fiberoptic segment.**

With Crossover Media Converters from Black Box, you don't need to worry about using crossover cables. Use the uplink switch to adapt the Converters to the type of cable you're using. Set the uplink switch to "X" when you go from twisted-pair to fiber, and "=" when you go from a fiber link to a workstation.

These Converters cost less than repeaters and don't use as much cable. And they're quick and easy to install in tight spaces. You can Velcro® mount them where you need them. The 100-Mbps models have an internal, autosensing power supply. The 10-Mbps models require an external power supply—select one **at right**. A complete set of LEDs indicating power and link status for each port lights up when segments at both ends are connected properly.

Use the Rack for Media Converters (at **right**) to mix and match any combination of Converters.

SPECIFICATIONS

CE Approval — All items listed are approved

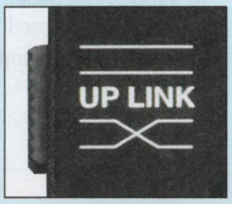
Speed — LH1500A–LH1501A: 100 Mbps; LE1500A–LE1502A: 10 Mbps

Connectors — LH1500A-SC, LH1501A: (1) RJ-45, (1) SC;
LH1500A-ST, LE1500A-UTP, LE1501A: (1) RJ-45, (1) ST;
LE1500A-BNC: (1) BNC, (1) ST;
LE1502A: (1) BNC, (1) RJ-45

Power — LH1500A-SC, LH1500A-ST, LH1501A: 90–250 VAC autosensing;
LE1500A-BNC, LE1500A-UTP, LE1501A–LE1502A: External power supply needed

Size — LH1500A–LH1501A: 3"H x 3.5"W x 1"D (2.5 x 8.9 x 7.6 cm)
LE1500A–LE1502A: 0.8"H x 3.5"W x 2.4"D (2.1 x 8.9 x 6.1 cm)

Weight — LH1500A–LH1501A: 0.6 lb. (0.3 kg); LE1500A–LE1502A: 0.3 lb. (0.1 kg)



Select either a workstation or passthrough connection with the uplink Switch and eliminate crossover cables.

FAXBACK INFORMATION
Request Document Number: 19307
Call 412-746-5500 Anytime

Item	Code	Price
Crossover Media Converters		
100-Mbps		
100BASE-TX/Fiber-SC (Multimode)	LH1500A-SC	**$695.00**
100BASE-TX/Fiber-ST (Multimode)	LH1500A-ST	**$695.00**
100BASE-TX/Fiber-SC (Single-Mode)	LH1501A	**$1995.00**
10-Mbps		
ThinNet/Fiber-ST (Multimode)	LE1500A-BNC	**$395.00**
10BASE-T/Fiber-ST (Multimode)	LE1500A-UTP	**$349.00**
10BASE-T/Fiber-ST (Single-Mode)	LE1501A	**$795.00**
ThinNet/10BASE-T	LE1502A	**$195.00**
Power Supply 115-VAC	PS1500	**$25.00**
230-VAC	PS1500E	**$25.00**
Rack for Media Converters	RM1500	**$125.00**
remember to order cables: Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned PVC	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		
Bulk Duplex Fiber Optic Cable, PVC, ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
For specific lengths or terminated cable, see pp. 74 and 118.		

Modular Media Converters

Mix-and-Match Modules Give You Conversion Flexibility.

- **Select from seven modular chassis to fit your application.**
- **Interchangeable conversion modules available in many combinations.**
- **No crossover cable needed for 10-Mbps modules.**

1 - Port Modular Media Converter
4 - Port Modular Media Converter
BLACK BOX
12 - Port Modular Media Converter
Activity
PWR

The 12-slot Chassis with Conversion Modules

Get flexibility with these Modular Media Converters from Black Box. Now you can add the modules you need—Ethernet, ThinNet, Fast Ethernet, Single- or Multimode Fiber—and have half- or full-duplex support.

Chassis

Select your Chassis according to the number of modules you need—1-, 4-, 8-, or 12-slot versions are available with an internal 120-/240-VAC power supply. The 12-slot version is also available with an internal -48 VDC power supply, and the 8-slot and 12-slot versions are rackmountable.

Other features of the 12-slot versions include: 1U and 2U models, reversible rackmount brackets, and chassis power connections on the opposite side of the data connections.

The 12-slot Chassis supports up to 12 independent media conversions of 10-Mbps Ethernet, 100-Mbps Fast Ethernet, or protocol-independent single-/multimode fiber in any combination.

Redundant Power Supply Modules for the 12-slot Chassis are also available. Choose from two versions—the PS7412A is 40 watts, 120/240 VAC; the PS7412A-DC is 50 watts, -48 VDC.

Conversion Modules

The 10-Mbps Conversion Modules have an internal 2-position switch on the twisted-pair port that eliminates the need for a crossover cable. Just select a crossover workstation or pass-through repeater/hub connection.

The 100-Mbps Conversion Modules provide a host of options for your Fast Ethernet.

Since they work in pairs, the Single-Mode to Multimode Modules come two to a package. These modules work with the 4-, 8-, and 12-Slot Chassis only.

The farther you run a fiber line, the more power it draws. So, if you're looking for greater distances, choose the Single-Mode versions with the higher power-consumption (dBm) specification.

FAXBACK INFORMATION
Request Document Number: 19448
Call 412-746-5500 Anytime

SPECIFICATIONS

Chassis

CE Approval — All items listed are approved

Size — LE7401A: 1.5"H x 4.7"W x 4.4"D (3.8 x 11.8 x 11.3 cm);
LE7404A: 1.8"H x 8.6"W x 5"D (4.4 x 21.9 x 12.7 cm);
LE7408A: 1.8"H x 17.5"W x 5"D (4.4 x 44.5 x 12.7 cm);
LE7412A, LE7412A-DC: 1.8"H x 17.5"W x 11.5"D (4.4 x 44.5 x 29.4 cm);
LE7412A-2, LE7412A-2DC: 3.5"H x 17.5"W x 6.8"D (8.9 x 44.5 x 17.1 cm)

Weight — LE7401A, LE7412A-DC: 2 lb. (0.9 kg);
LE7404A: 3.5 lb. (1.6 kg);
LE7408A: 6.3 lb. (2.8 kg);
LE7412A, LE7412A-2, LE7412A-DC, LE7412A-2DC: 11 lb. (5 kg)

Modules

CE Approval — All items listed are approved

Speed — LE740-TPSTS, BNSTM: 10 Mbps;
LH740-TPSCM: 100 Mbps;
LE740-SMMM: Up to OC3 speeds (155 Mbps)

Item	**Code**	**Price**
Chassis		
120/240 VAC Power Supply		
1-Slot	LE7401A	**$120.00**
4-Slot	LE7404A	**$200.00**
8-Slot	LE7408A	**$380.00**
12-Slot (1U High)	LE7412A	**$700.00**
12-Slot (2U High)	LE7412A-2	**$700.00**
48-VDC Power Supply		
12-Slot (1U High)	LE7412A-DC	**$1000.00**
12-Slot (2U High)	LE7412A-2DC	**$1000.00**
10-Mbps Conversion Modules		
10BASE-T/Fiber-ST (Multimode)	LE740-TPSTM	**$320.00**
10BASE-T/Fiber-ST (Single-Mode) 7.0-dBm	LE740-TPSTS	**$670.00**
10BASE-T/Fiber-ST (Single-Mode) 16.5-dBm	LE740-TPSTS20	**$1000.00**
BNC/Fiber-ST (Multimode)	LE740-BNSTM	**$200.00**
10BASE-T/BNC (Single-Mode)	LE740-TPBNC	**$200.00**
100-Mbps Conversion Modules		
100BASE-TX/Fiber-SC (Multimode)	LH740-TPSCM	**$750.00**
100BASE-TX/Fiber-SC (Single-Mode) 6.0-dBm	LH740-TPSCS	**$1100.00**
100BASE-TX/Fiber-SC (Single-Mode) 16.5-dBm	LH740-TPSCS20	**$1400.00**
100BASE-TX/Fiber-ST (Multimode)	LH740-TPSTM	**$750.00**
100BASE-TX/Fiber-ST (Single-Mode) 6.0-dBm	LH740-TPSTS	**$1100.00**
100BASE-TX/Fiber-ST (Single-Mode) 14.0-dBm	LH740-TPSTS20	**$1400.00**
Single-Mode to Multimode Modules		
1300-nm Single-Mode to 1300-nm Multimode	LE740-SMMM2	**$2000.00**
1320-nm Single-Mode to 1320-nm Multimode	LE740-SMMM	**$2400.00**
Redundant Power Supply Modules		
40 Watts, 120/240-VAC	PS7412A	**$200.00**
50 Watts, -48-VDC	PS7412A-DC	**$600.00**
remember to order cables Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned, PVC	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		
Bulk Duplex Fiber Optic Cable, PVC, ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
For specific applications or bulk cable, see pp. 74 and 118.		

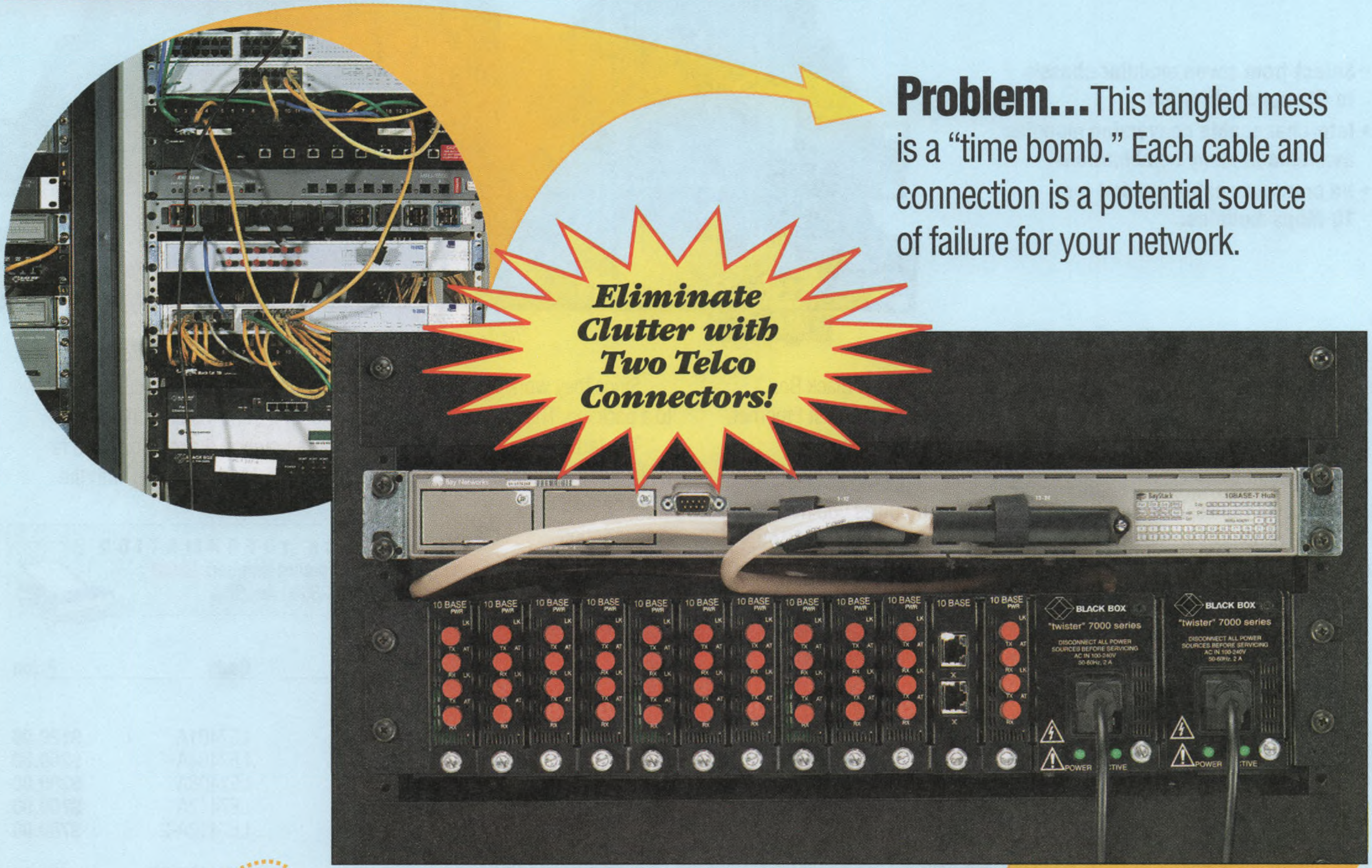
high-speed

Eliminate Points of

Replace that Nest of Cables on Your

Twister 7000 Family Extension

Problem... This tangled mess is a “time bomb.” Each cable and connection is a potential source of failure for your network.



Eliminate Clutter with Two Telco Connectors!

Top: Bay Networks™ 10BASE-T Hub (CG1001E04); Bottom: 12-Slot Chassis with Dual Power Supply (LE7312A-PS).

BLACK BOX SOLUTION... Two Telco connectors eliminate clutter. You get the media converter you need, and it’s easy to test and install.

- **Two telco connectors eliminate the mass of wires in your rack.**
- **Create a high-density 24-port 10BASE-T to 10BASE-FL conversion unit.**
- **Compatible with a 10BASE-T hub or switch with telco ports.**
- **Eliminates the need for a punchdown block.**
- **One premade cable reduces testing and installation time.**
- **Available with or without dual power supply.**

SPECIFICATIONS

CE Approval — All items listed are approved

Connectors — LE7312A, LE7312A-PS: (2) Telco;
LE7302C: (2) RJ-45;
LE7324C–LE7326C: (2) separate multimode or single-mode fiberoptic ST® connectors

Size — LE7312A, LE7312A-PS: 3.5"H x 17"W x 11.3"D (8.9 x 43.2 x 28.7 cm)

Weight — LE7312A, LE7312A-PS: 20 lb. (9 kg)

For specifications on other Twister 7000 products, see page 488.

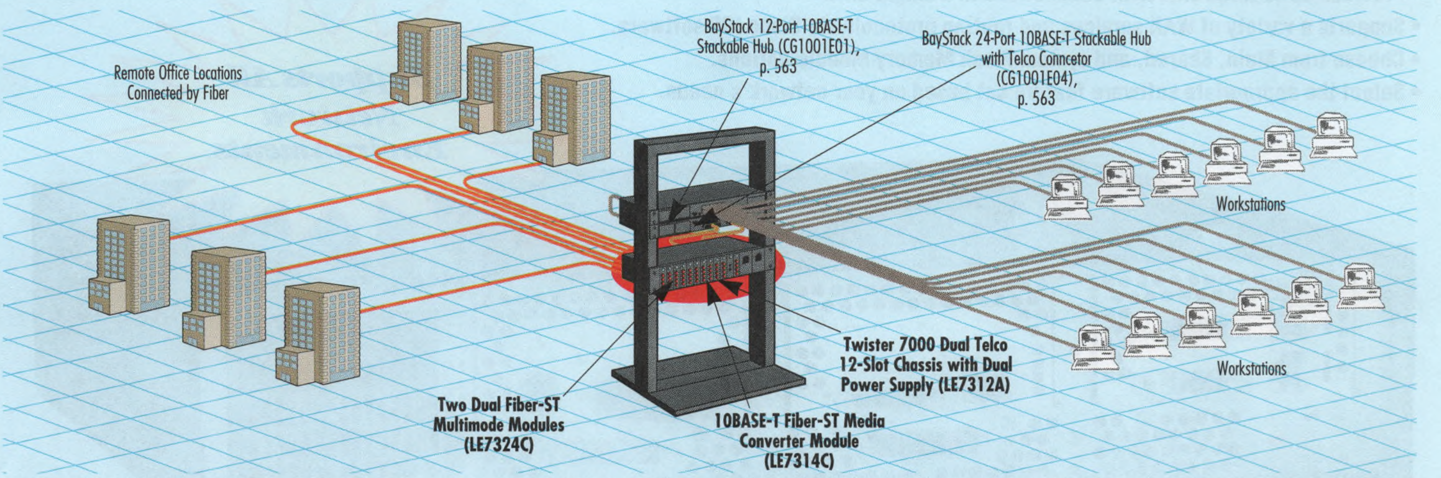
10BASE-T ↔ BNC

10BASE-T ↔ Fiber

100BASE-T ↔ Fiber

Failure on Your Network.

Rack with Just Two Telco Connectors.


Remote Office Locations Connected by Fiber
BayStack 12-Port 10BASE-T Stackable Hub (CG1001E01), p. 563
BayStack 24-Port 10BASE-T Stackable Hub with Telco Conncetor (CG1001E04), p. 563
Workstations
Workstations
Twister 7000 Dual Telco 12-Slot Chassis with Dual Power Supply (LE7312A)
Two Dual Fiber-ST Multimode Modules (LE7324C)
10BASE-T Fiber-ST Media Converter Module (LE7314C)

You need to convert between 10BASE-T and fiber. But you also have a nest of wires behind your equipment rack. And each cable and punchdown connection can be a point of failure—and one failure can bring down your whole LAN. Plus, it can take days to test and connect all the wires in a punchdown block.

That's where the Twister 7000 12-Slot Chassis can help. With two telco connectors at the rear of the unit, you can connect any 10BASE-T hub or switch with telco connectors to fiber—and clean up that mess of cables.

With the Twister 12-Slot Chassis, you plug the pre-made telco cables directly into the media converter. You only have to test one cable, and you don't need a punchdown block.

The Twister 12-Slot Chassis is an extension of the BLACK BOX® Twister 7000 Series. The 12-slot modular chassis supports a single or dual media conversion from UTP to fiber (10 or 100 Mbps). The dual-port conversion modules—used in conjuction with the chassis' Telco connectors—enable you to support up to 24 connections on the chassis.

The modular design can keep pace with your changing LAN topology needs. Just insert the individual modules you need to create a diverse media translation solution to serve your network requirements.

Additional 10- and 100-Mbps Modules are also available to meet your entire range of media converter needs. See **page 488** for more information on the rest of the Twister 7000 Series.

10 BASE
100 BASE
100 BASE

LE7314C *LH7414C* *LH7415C*

PLUS! Twister 7000 Series, **see p. 488.**

FAXBACK INFO
Request Document Number: 17374
Call 412-746-5500
Anytime

NOTE: Chassis has male telco connectors.

CE Approved — All items listed are approved

Item	**Code**	**Price**
Twister 7000 Series		
Dual Telco 12-Slot Chassis		
with Single Power Supply	LE7312A	**$900.00**
with Dual Power Supply	LE7312A-PS	**$1100.00**
Dual Fiber-ST Modules		
Multimode	LE7324C	**$480.00**
Single-Mode	LE7326C	**$1230.00**
Dual Twisted-Pair Module	LE7302C	**$79.00**
10-Mbps Modules		
10BASE-T/BNC	LE7313C	**$189.00**
10BASE-T/Fiber-ST (Multimode)	LE7314C	**$269.00**
(Single-Mode)	LE7316C	**$819.00**
100-Mbps Modules		
100BASE-T/Fiber-SC (Multimode)	LH7414C	**$659.00**
100BASE-T/Fiber-SC (Single-Mode)	LH7416C	**$2199.00**
100BASE-T/Fiber-ST (Multimode)	LH7415C	**$659.00**
Blank Panel	LE7301A	**$24.00**

remember to order cables

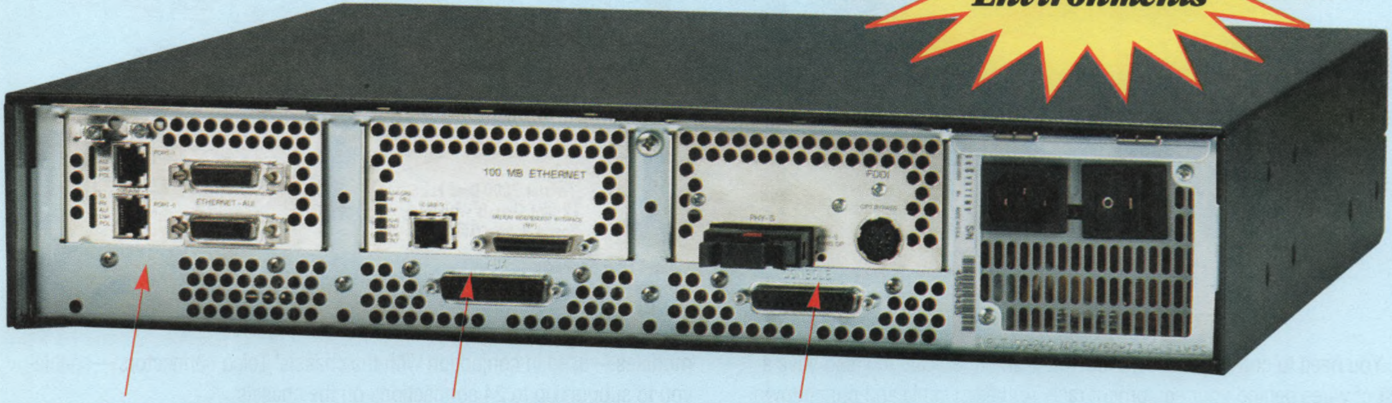
Telco-Type Connector Cable, 5-ft. (1.5-m)	ELN25T-0005-MM	**$19.95**
For other lengths and genders, see p. 71.		
Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned PVC	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		
Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
For specific applications or bulk cable, see pp. 74 and 118.		

Cisco 4500 Series Modular Routers

The Modular Routing Solution for FDDI,

- **Enables simple, inexpensive additions, changes, and upgrades to your existing network.**
- **Provides up to three LAN/WAN connections in a single unit.**
- **Supports a variety of WAN services and routing protocols via Cisco IOS software.**
- **Choose from Main, Shared, and system Flash Memory Module options.**
- **Select the appropriate software feature set based on your network's needs.**

Supports All Network Environments



2-Port 10BASE-T Module with (2) 10-Mbps RJ-45 and (2) DB15 ports

1-Port 100BASE-TX Module with (1) 100-Mbps RJ-45 and (1) DB40 port

1-Port Single FDDI Module with (1) Multimode FDDI and (1) 6-pin DIN port

With these Modules installed, you can connect to both Ethernet and Fast Ethernet LANs and make an FDDI WAN connection.

With Cisco 4500 Series Modular Routers from Black Box, you get a configurable, fully modular routing solution. The Series is so flexible you can support a range of networking environments—including 10- and 100-Mbps Ethernet, FDDI and Token Ring—and have enough connectivity choices to grow with your network.

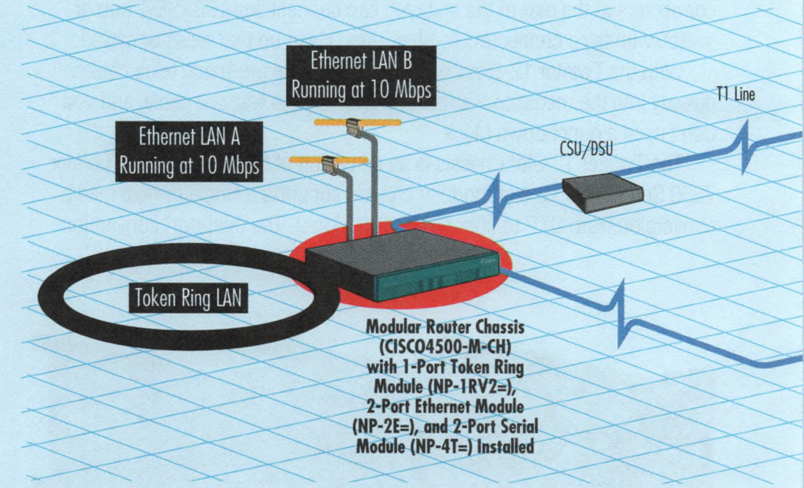
The chassis supports up to three Network Processor Modules (NPMs)—indivdual removable cards you can use to make external network connections. The available Modules support a number of protocols, line speeds, and transmission types, which means you can support a variety of computing environments. And since the Modules are easy to install and remove, you can change the modules to keep pace with technological advancements.

With Flash EPROM as a standard feature of the 4500 Series, you can distribute and install software from a central location. Once completed, the Router automatically reboots programs you've stored in Flash memory.

Three different memory types are available—main DRAM, shared DRAM, and Flash—and each type serves a different purpose in routing packets. You can also alter your memory requirements as your internetworking demands change.

You can upgrade:

- Main DRAM if you need to expand your network, add protocols, or alter your IOS software releases.
- Shared DRAM to improve performance or to use higher densities or more physical or virtual interfaces.
- Flash memory to hold several IOS software images for simple management.



Modular Router Chassis (CISCO4500-M-CH) with 1-Port Token Ring Module (NP-1RV2=), 2-Port Ethernet Module (NP-2E=), and 2-Port Serial Module (NP-4T=) Installed

These Routers run Cisco's industry standard IOS™ software—available in a variety of Feature Sets so you can choose the most appropriate set to support your specific protocol environment. IOS software enables you to support both LAN and WAN protocols, control access to your network, and centralize your management functions.

CISCO SYSTEMS
PARTNER
PREMIER RESELLER
PENNSYLVANIA

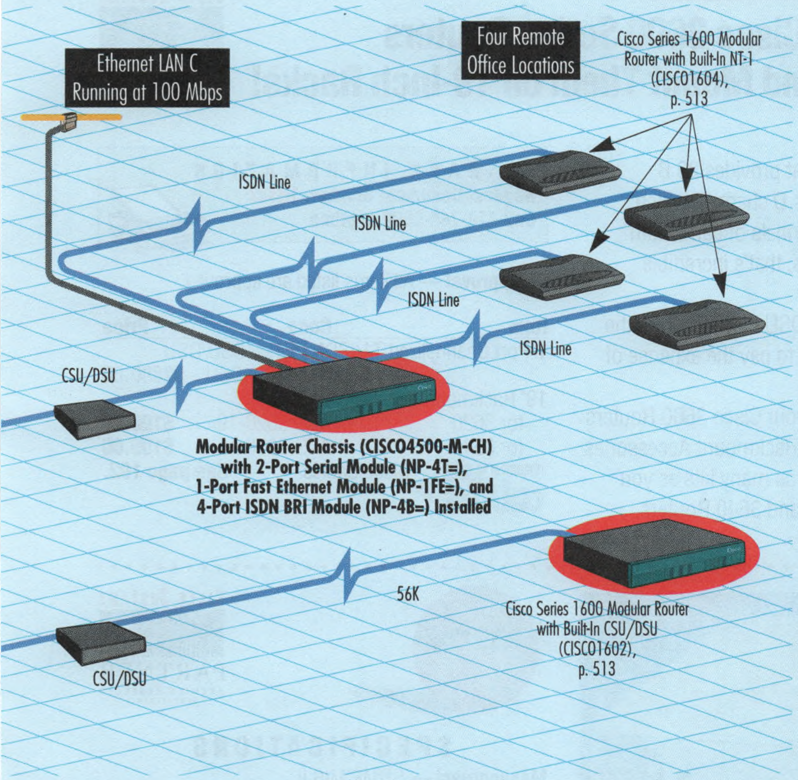
FAXBACK INFORMATION
Request Document Number: 19314
Call 412-746-5500 Anytime

Token Ring, and Ethernet Networks.

SPECIFICATIONS

Memory — Flash: 4 MB standard, expandable to 8 or 16 MB;
Main: 16 MB standard, expandable to 32 MB;
Shared: 4 MB standard, expandable to 32 MB
LEDs — (3) Network Activity, (1) Power, (1) Run
Connectors — NP-2E=: (2) RJ-45, (2) DB15;
NP-6E=: (6) RJ-45;
NP-1FE=: (1) RJ-45, (1) MII40;
NP1RV2=: (1) DB9;
NP-2R=: (2) DB9;
NP-1F-S-M=: (1) FDDI, (1) 6-pin DIN;
NP-1F-D-MM=: (2) FDDI, (1) 6-pin DIN;
NP-1F-DD-SS=: (2) duplex single-mode fiber-SC;
NP-4T=: (4) 64-pin D shell;
NP-4B=: (4) RJ-45 ISDN BRI;
NP-8B=: (8) RJ-45 ISDN BRI;
NP-CT1=: (1) DB15
Power — 100–240 VAC, 47–63 Hz
Size — 3.4"H x 17.6"W x 17.7"D (8.6 x 44.7 x 43.4 cm)
Weight — 24 lb. (10.9 kg)

LAN Connections		**WAN Connections**	
▬	Ethernet	☁	T1/E1
▬	Fast Ethernet	☁	X.25
▬	Token Ring	☁	Frame Relay
▬	FDDI	☁	Switched 56K
		⚡	Leased Line


Ethernet LAN C Running at 100 Mbps
Four Remote Office Locations
Cisco Series 1600 Modular Router with Built-In NT-1 (CISCO1604), p. 513
ISDN Line
ISDN Line
ISDN Line
ISDN Line
CSU/DSU
Modular Router Chassis (CISCO4500-M-CH) with 2-Port Serial Module (NP-4T=), 1-Port Fast Ethernet Module (NP-1FE=), and 4-Port ISDN BRI Module (NP-4B=) Installed
56K
Cisco Series 1600 Modular Router with Built-In CSU/DSU (CISCO1602), p. 513
CSU/DSU

Adding a new or different Feature Set may require you to purchase additional memory. Check the memory requirements of each Feature Set before installing it in your network.

Before you select the best Modules to meet your internetworking needs, be aware that certain configuration restrictions do exist. The main rule is that no more than two high-speed NPMs can be supported by these Routers at any given time. For other restrictions on installing NPMs, please contact Technical Support.

Item			**Code**	**Price**
Cisco 4500 Series Modular Router Chassis			CISCO4500-M-CH	**$7700.00**
Network Processor Modules				
10BASE-T		2-Port	NP-2E=	**$3000.00**
		6-Port	NP-6E=	**$6000.00**
100BASE-TX		1-Port	NP-1FE=	**$4000.00**
Token Ring		1-Port	NP-1RV2=	**$2300.00**
		2-Port	NP-2R=	**$4600.00**
FDDI	Multimode	1-Port Single	NP-1F-S-M=	**$6100.00**
		1-Port Dual	NP-1F-D-MM=	**$7300.00**
	Single-Mode	1-Port Dual	NP-1F-D-SS=	**$8100.00**
Serial	4-Port		NP-4T=	**$4600.00**
ISDN BRI		4-Port	NP-4B=	**$1200.00**
		8-Port	NP-8B=	**$1600.00**
Channelized T1/ISDN PRI		1-Port	NP-CT1=	**$2750.00**
Memory Modules				
Flash	4 MB		MEM-4500M-4F=	**$400.00**
	16 MB		MEM-4500M-16F=	**$1100.00**
Main	16 MB		MEM-4500M-16D=	**$1000.00**
	32 MB		MEM-4500M-32D=	**$1900.00**
Shared	8 MB		MEM-4500M-8S=	**$700.00**
	16 MB		MEM-4500-16S=	**$1000.00**
IOS Software Feature Set Modules				
IP			CD45-C-+11.2=	**$15.00**
Plus Feature Pack			CD45-CP-11.2=	**$700.00**
Plus with 40-Bit Data Encryption			CD45-CW-11.2=	**$3700.00**
Plus with 56-Bit Data Encryption			CD45-CY-11.2=	**$3700.00**
Desktop IP/IPX/AT/DEC S S/W			CD45-B-11.2=	**$400.00**
Plus Feature Pack			CD45-BP-11.2=	**$1100.00**
Plus with 40-Bit Data Encryption			CD45-BW-11.2=	**$4100.00**
Plus with 56-Bit Data Encryption			CD45-BY-11.2=	**$4100.00**
Enterprise			CD45-A-11.2=	**$1500.00**
Plus Feature Pack			CD45-AP-11.2=	**$2200.00**
Plus with 40-Bit Encryption			CD45-AW-11.2=	**$5200.00**
Plus with 56-Bit Encryption			CD45-AY-11.2=	**$5200.00**
remember to order cables 4500 Series RS-232 Cable, DTE, Male, 10-ft. (3.0-m)			CAB-NP232T=	**$100.00**
Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned PVC			EYN737MS-0010	**$10.95**
			For other lengths and pinnings, see p. 68.	
Bulk Duplex Fiber Optic Cable, PVC ST-ST			EFN062-CC	**$79.95 + $.70/ft.**
			For terminated cable or specific lengths, see pp. 74 and 118.	

Works with Cisco 2500 Series Routers.

See pp. 516–517.

Cisco 2524/2525 3-Port Router Modules

Add Digital and Sync Versatility to Your LAN.

- **Modules give you flexibility to extend your corporate LAN to remote sites—without external devices, cabling, or complicated installation procedures.**
- **Choose from optional CSU/DSU, Sync Serial, and ISDN BRI Modules.**

If you want to extend your corporate LAN to remote sites, the Cisco 2524/2525 Routers are the way to go. But why stop there? These Routers can do *so much more*. So populate them with today's most versatile communication Modules!

Cisco 2524/2525 Routers come with three slots that accommodate up to two CSU/DSU and and Sync Serial Modules. And they can also take one ISDN Module.

For 2- and 4-wire applications, our CSU/DSU Modules can send data at 56 or 64 Kbps. And the FT1/T1 Module sends data up to 1.544 Mbps!

With the Five-in-One Sync Serial Module, you can support any of the following five types of signaling: EIA/TIA-232, EIA/TIA-449, V.35, X.21, and EIA-530.

And if you send data over ISDN, slide in an S/T or Integrated NT1 Module. The NT1 gives you a direct connection to the ISDN wall jack—saving you the cost of an external NTU.

FAXBACK INFORMATION
Request Document Number: 18416
Call 412-746-5500 Anytime

CE Approval — All items listed are approved

Item	**Code**	**Price**
Cisco 2524/2525 3-Port Router Modules		
CSU/DSU		
2-Wire Switched 56K	SM25-56K2	**$900.00**
4-Wire 56/64 Kbps	SM25-56K4	**$700.00**
Fractional T1/T1	SM25-T1	**$1600.00**
Five-in-One Synchronous Serial	SM25-5INI	**$200.00**
ISDN BRI	SM25-BRI-S/T	**$600.00**
w/Integrated NT1	SM25-BRI-U	**$750.00**
remember to order cables — Cisco Cables		**See page 102.**

* * *

Works with Cisco 3600 Series Routers.

See p. 522.

Cisco 3600 Series Accessories

Connect Your Cisco 3600 Series Routers to ISDN PRI. And Mount Them on 19-Inch Racks!

- **T1/ISDN PRI Module includes built-in CSU/DSU.**
- **Individual Rackmount kits for your Cisco 3620 and 3640 Modular High-Performance Access Routers.**

Cisco 3600 Modular High-Performance Access Routers are your LAN-to-LAN/user-to-LAN internetworking solutions. Now Black Box has an additional Module and Rackmount kits to make the Cisco 3600 Series *complete*.

The 1-Port Channelized T1/ISDN PRI Module with CSU/DSU enables the 3620 and 3640 to tap into the power of ISDN Primary Rate Interface. This is an ISDN service that provides 23 B channels and one 64-Kbps D channel, which is equivalent to the 24 channels of bandwidth in a T1 line. In other words, that's incredible communications power!

With the built-in CSU/DSU connecting to the digital line, you don't have to pay the expense of an external NTU.

If you want to mount your Cisco 3600 Routers on 19" racks, we have the Rackmount Accessories to get the job done! Order as many kits as you need for your Cisco 3620 and 3640 Routers.

FAXBACK INFORMATION
Request Document Number: 18447
Call 412-746-5500 Anytime

CE Approval — All items listed are approved

Item	**Code**	**Price**
1-Port Channelized T1/ISDN PRI w/ CSU/DSU	NM-1CT1-CSU	**$2800.00**
19" Rackmount Accessories		
for 3620	ACS-3620-19=	**$100.00**
for 3640	ACS-3640-19=	**$100.00**
remember to order cables — Cisco Cables		**See page 102.**

* * *

Cisco Micro Webserver

Capture More Customers in Your Web (Site).

- **Turns your PC into a Web server.**
- **Built-in zip drive and security.**
- **Connect to CD-ROMs and hard drives for greater storage.**

If you're going to capture more business on the Web, we have cost-effective server solutions for you!

The Micro Webserver enables you to set up your PC as a Web server. It configures in minutes, and its JAVA graphical interface is user-friendly.

The Micro Webserver interfaces with either Netscape Navigator® or Internet Explorer browsers. Its removable zip drive provides 100 MB of data and application storage, making it easy to update your Web page. Need more storage? The Webserver can connect up to six peripherals such as CD-ROM drives and other hard drives.

The Webserver is secure, too. Password protection for multiple users is included, reducing the opportunity for hacking.

FAXBACK INFORMATION
Request Document Number: 19321
Call 412-746-5500 Anytime

SPECIFICATIONS

Management — SNMP MIB II
Protocol — HTTP 1.1 compliance
CE Approval — Yes
Interface — Network: 10BASE-T; Peripherals: SCSI
Indicator — LED: Status
Power — 120–240 VAC, 50–60 Hz
Size — 1.6"H x 7.4"W x 9.3"D (4.1 x 18.8 x 23.6 cm)
Weight — 2.5 lb. (1.1 kg)

Item	**Code**	**Price**
Cisco Micro Webserver	MWEB100	**$995.00**
remember to order cables — Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned, PVC	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

SuperSwitch 24 Modules

Modules Exclusively for Your SuperSwitch 24. Now You Can Bring Even More High-Speed Switching to Your Network!

Works with our SuperSwitch.

See p. 484.

- **Connect to Fast Ethernet networks in full- or half-duplex mode via high-speed UTP and UTP/fiber Modules.**
- **Enable wire-speed filtering and forwarding rates of 650,000 pps.**
- **Configure Modules in half-duplex mode for shared networks.**
- **Or configure Modules in full-duplex mode for networks running up to 200 Mbps.**

CE Approval — All items listed are approved

FAXBACK INFORMATION
Request Document Number: 19101
Call 412-746-5500 Anytime

Does your network rely exclusively upon the BLACK BOX® Superswitch 24? If so, we now offer Modules native to the unit.

Available Modules include:

- Dual-Port 10/100 UTP Module that provides the bandwidth to drive your 10- and 100-Mbps applications.
- Dual-Port 100BASE-FX Modules that can drive data up to 4, 18, or 40 km respectively.
- Switched Ethernet/100BASE-FX Modules that can can drive data up to 4, 18, or 40 km respectively.

Item	Code	Price
SuperSwitch 24 Modules		
Dual-Port 10/100 UTP	LB9321-TX	**$1195.00**
Dual-Port 100BASE-FX		
Multimode	LB9321-FX	**$1575.00**
Single-Mode	LB9321-SMFX	**$2055.00**
Single-Mode Extended Distance	LB9321-SOFX	**$2285.00**
10/100 UTP/100BASE-FX		
Multimode	LB9321-TX/FX	**$1345.00**
Single-Mode	LB9321-TX/SMFX	**$1755.00**
Single-Mode Extended Distance	LB9321-TX/SOFX	**$1955.00**

remember to order cables

Item	Code	Price
Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned, PVC	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

3Com SuperStack II Fast Ethernet Switch Modules

Further Improve Your Workgroup Management with Fast Ethernet Switching.

Works with 3Com SuperStack II Switches.

See p. 483.

- **Give your SuperStack II Fast Ethernet Switch 10 times the boost in performance— 100-Mbps speed with each Module.**
- **Both Modules support RMON, SNMP, and Telnet management protocols.**

Performance.

When your 3Com SuperStack II Switches run at 10 Mbps—or full wire speed—on each port, *that's* performance.

But 3Com has improved upon its performance.

Now your SuperStack II Switches can attain 100-Mbps Fast Ethernet speeds on each port with the new 3Com Fast Ethernet Switch Modules from Black Box.

The Modules are available for 100BASE-FX and 100BASE-TX. They're simple to install. Just slide them in and you're ready to cruise.

Add as many Modules as you want, depending on your internetworking needs.

Both the 100BASE-FX Module and the 100BASE-TX Module support most major management protocols, including RMON, SNMP, and Telnet™.

FAXBACK INFORMATION
Request Document Number: 18533
Call 412-746-5500 Anytime

CE Approval — All items listed are approved

Item	Code	Price
3Com SuperStack II Fast Ethernet Switch Modules		
100BASE-FX	3C16920	**$995.00**
100BASE-TX	3C16922	**$695.00**

remember to order cables

Item	Code	Price
Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned, PVC	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

Fast MiniHub Stand

Put Your MiniHub Where You Need It, Even if Space Is at a Premium.

Works with our Fast MiniHubs.

See pp. 490–491.

- **Durable metal stand.**
- **Prevents overheating, protects against dirt.**
- **Side-mounts your MiniHub on the floor.**
- **Saves desktop space.**

The Fast MiniHub Stand is a score on the floor, especially when desk space—or any space—is at a premium.

The Stand is made of durable metal which anchors your MiniHub to the floor. Sidemount your MiniHub next to your desk, or on the wiring closet's floor, or on the floor next to workgroup repeaters.

And the BLACK BOX® Fast MiniHub Stand is safe for your MiniHub, too. By sidemounting you unit upright, the MiniHub's cooling fan is not restricted by the carpet—which means your MiniHub won't be subjected to overheating. And sidemounted MiniHubs are also kept safe from dust and dirt which may be tracked in.

So even when space is tight, you can still integrate 10- and 100-Mbps LAN users with the Fast Personal MiniHub 5 Plus or the Fast Ethernet MiniHub-4.

Take a Stand today!

BLACK BOX
Fast Personal MiniHub-5 Plus

Upright is all right! The Fast MiniHub Stand frees up desk space. Sidemount the Hub next to your desk.

FAXBACK INFORMATION
Request Document Number: 16050
Call 412-746-5500 Anytime

Item	Code	Price
Fast MiniHub Stand	LH0005-STND	**$35.00**

Constantly Updated Technology...
Constantly Updated Information...
Constantly Recertified Products...

QUALITY PLUS

Be Sure You're Getting the Best.

How can you find the best print server...or the sharpest video converter?

Just count on Black Box. Everything we offer goes through a rigorous certification before it goes into our Catalog. We compare each item to the competition's. If ours isn't the best, it goes back to the drawing board.

And Black Box quality doesn't stop there. Everything in our Catalog is constantly re-examined to make sure it's *still* the best.

That's how we can offer our 45-day guarantee: If what you ordered doesn't meet your highest expectations, we'll take it back—no questions asked.

Giving you the best equipment and the best service—that's what we call Quality Plus.

BLACK BOX-
CERTIFIED

What does it mean when we talk about reliability? It means you can count on a Black Box product working right the first time. And every time after that. Everything you see in this Catalog is guaranteed for at least a year.

But it doesn't stop there. Many of our world-famous cables and switches are Guaranteed for Life! You'll never have to replace them. Look for this symbol throughout the Catalog.

ABSOLUTELY GUARANTEED FOR LIFE

The Latest News from Black Box.

Keep up to date with the latest information on our huge selection of guaranteed solutions. Call our FaxBack system to request these lists. Just dial **412-746-5500** and press **1**, **4**:

• Price Changes

Big savings! Check out our new lower prices!

Request Document Number: 17989

• Cross-Reference for Older Products

Not only can you find what products are discontinued, you can also find our recommended replacements.

Request Document Number: 18007

• Short List of Catalog Corrections

Sometimes even we make mistakes. This list will tell you the very few we've made.

Request Document Number: 17996

What Have We Updated Lately? Check it Out!

So far this year, we've updated several hundred manuals, faxbacks, and products. In addition, we've introduced hundreds of new products.

The lists below contain only a portion of our updated items. For complete lists, call our FaxBack system at **412-746-5500**. Press **1**, **4**, and use the FaxBack numbers at the end of each list below to make your request.

Updated Manuals!

AC088A (2-Channel Splitter)
AC331A (VGA/Video Converter)
CDE400A-R2 (CD-ROM Discport)
IC102C (Serial Host Adapter)
IC112C-R2 (8-Port Serial Interface)
IC124A (SCSI Differential Cnvrtr.)
MD833A-R5 (Modem 32144)
MD855A-R2 (Modem V.34)
ME109A (Sync Modem Eliminator)
ME310A (Industrial Fiber Driver)
ME375A (Async/Sync 2-Wire SHM)
ME480A (Mod. Campus Driver)
ME680C (Line Driver Card)
ME771A-FSP-R2 (Mini Driver MP)
ME862A-FSP-R2 (HS Mini Driver)
PCM71 ((3174 BCS Firmware)
PC455-WIN (Windows Em. Sftwr.)
MT160A (Micro CSU/DSU Card)
SW721A (-R3 (PC ServSwitch)

And more!

FAXBACK INFORMATION
For the Complete List,
Request Document Number: 18014
Call 412-746-5500 Anytime

Updated FaxBacks!

AE1001010 (Access Node Hub)
CISCO761-US (Router, Ethernet ISDN)
3C16670A (Superstack II Hub)
3C16700 (OfficeConnect Hub)
EFN4070A (Armored Tube Cable)
FX810A-R2 (Campus Pager)
IC112C-R2 (Serial Host Adapter)
KV104A (4-Port ServSwitch)
KV150A (Multi ServSwitch)
LE8003A (4-Port ENC Repeater)
LR2800A-X25 (Remote Ethernet Hub)
LR3001A (Frame-Relay Bridge/Router)
MC060A (Rapid Charger/Conditioner)
MD3300A-R2 (Industrial Modem)
ME521A (Multipoint Line Driver)
MX239A (Multiserver 5000 Turbo Pro)
PI320A-R3 (PC Parallel Extender Kit)
SW720C-R3 (Overlay Option Board)
SW721A-R2 (2 to 1 ServSwitch)

And more!

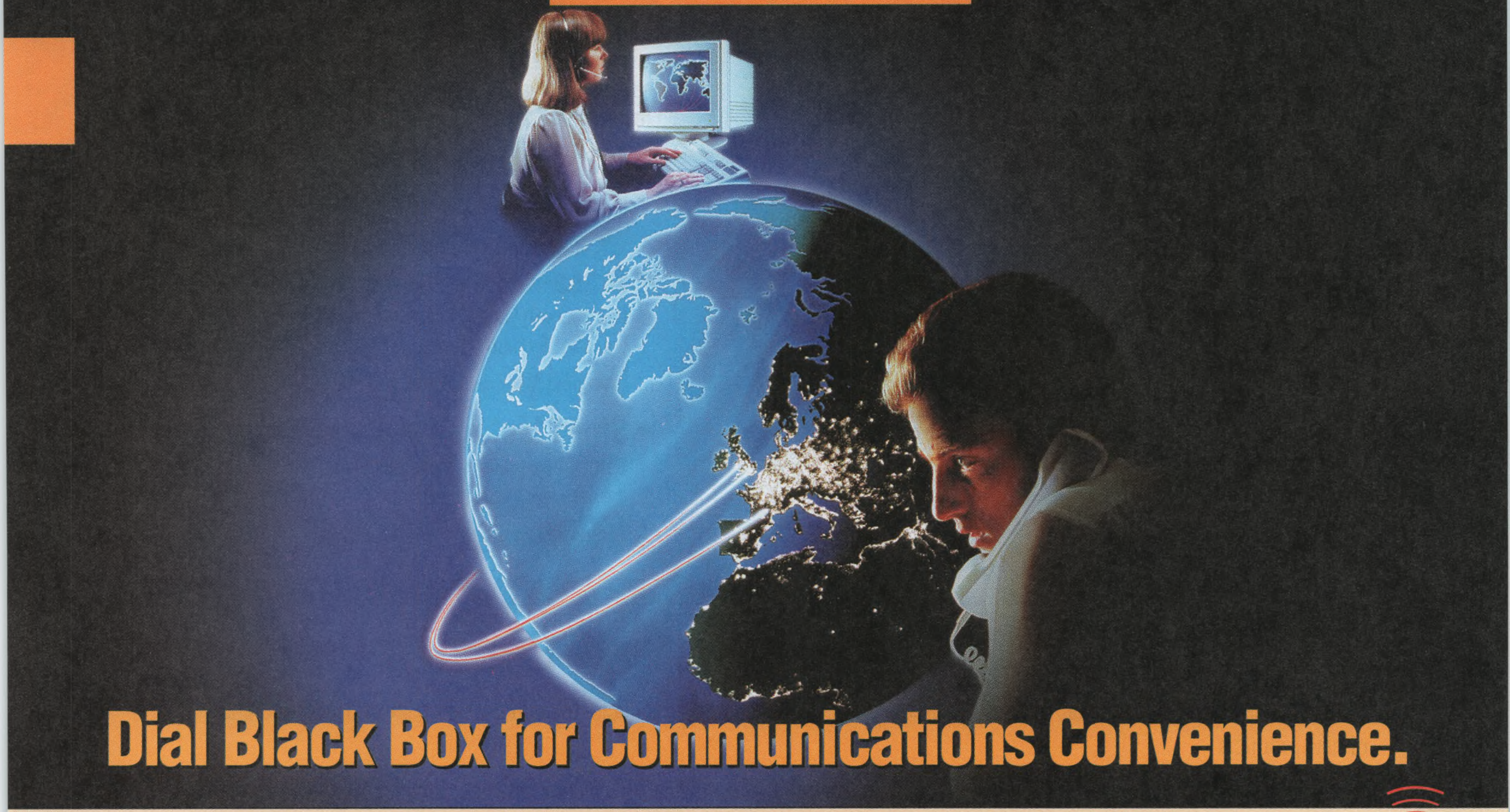
FAXBACK INFORMATION
For the Complete List,
Request Document Number: 18021
Call 412-746-5500 Anytime

Updated Products!

AC485A (Remote Mouse)
CDE400A-R2 (CD-ROM Miniserver)
CS1050 (ConferenceLink Phones)
FX126A (LineShare 230B)
IC112C-R2 (Serial Host Adapter)
IC714A-V35-R2 (Codirectional Cnvrtr.)
IS280A-R2 (ISDN Service Unit)
KV2060-R2 (ServSwitch Multi Cables)
LE2104A-TP-R2 (Terminal Server)
LE2608A-BNC-R2 (Terminal Server)
LE611A-ST-R2 (10-BT/Fiber Cnvrtr.)
LRA508A-ET-R2 (8-Port Ethernet)
ME376A-R2 (2-Wire SHM)
ME444A-R3 (V.35 Line Driver)
ME745A-F-R2 (Minidriver MP)
ME862A-MSP-R2 (HS Minidriver)
MX227-R2 (Multiserver Modem)
PI320A-R3 (PC Parallel Extender Kit)
TD113V-R2 (Serial 4.5 Software)

And more!

FAXBACK INFORMATION
For the Complete List,
Request Document Number: 18038
Call 412-746-5500 Anytime



Dial Black Box for Communications Convenience.

Reach the World Even Faster.

Face it—the telephone is your lifeline to the world. In the office, on the road, and at home, you depend on it. Enhance your communications with the perfect modem for surfing the net or telecommuting—the Sportster™ 33.6 Modem on **page 50**. Work the Web over regular analog phone lines at 33.6 Kbps, or download up to 56 Kbps with an x2™ upgrade. Includes software, too!

Ammunition for the Mobile Warrior.

Drive safely and take care of business with our Hands-Free Car Kit (**page 48**). Charge your phone, pack it up, and power it with our full line of cellular phone accessories on **pages 48–49**.

You can even modem data from anywhere in the world with our new Globe-Trotter Solution Pak on **page 51**.

Fewer Phone Lines = Lower Phone Bills.

Eliminate multiple phone lines without affecting your service. All you lose are the phone bills. Do it with our new LineSharers on **page 56**. Run your phone, answering machine, fax or modem on one line and save a bundle! And prevent accidental phone extension pickups from bumping you off the Internet with The Eliminator (**page 55**).

The Full Circle of Protection for Your Home Office.

Now you can *afford* to surround your home office with big-time surge and backup power protection. The APC® Back-UPS® Office™ (**page 58**), gives you surge suppression, modem line protection, *and* backup battery power. Get the world's most reliable power protection from APC®, the brand that protects more networks than all others combined.

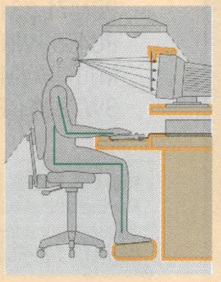
BLACK BOX® + APC = the best!

Campus Connections.

You need to reach a colleague—now! Instead of mounting an office-to-office search—get instant contact with the Campus Pager (**page 57**). Use the Campus Pager to reach people within a two-mile radius.

Creature Comforts.

Our high-tech world takes its toll on legs, wrists, shoulders, necks, even eyes. That's why Black Box offers a line of furniture and accessories designed to make every workstation fit the person—not the other way around. Take a look at our WorkManager™ Computer Desk System and accessories on **pages 60–63**.



BLACK BOX
SOLUTIONS

7000 Connectivity Solutions

"I don't want the expense of extra phone lines for my fax. Do you have a switch for telephones?"

It's easy to set up the LineShare. Just plug in your devices and plug in the phone line.

You've Come to the Right Place!

Take a look at our **LineShare** series on **page 56**. It's your ideal solution for running three or four devices, including a telephone, an answering machine, a fax, and a modem on one telephone line.

Routes Calls Automatically.

A LineShare is like an automatic switch for your telephone. Just plug one in. It sorts voice calls from data calls automatically and sends them to the right device. You can even talk *and* receive faxes during one call. And you don't have to turn knobs every time you want to use a different device.

Handles Distinctive-Ring Service, Two-Line Phones, and More.

You won't miss an important call, fax, or e-mail. The LineShare 120B and 230B work with distinctive ring, voice mail, and Caller ID services. And if you have a two-line telephone, go for the LineShare 230B! It handles both lines and can turn your fax into a scanner or printer.

BLACK BOX
SOLUTIONS

One-Stop Shopping

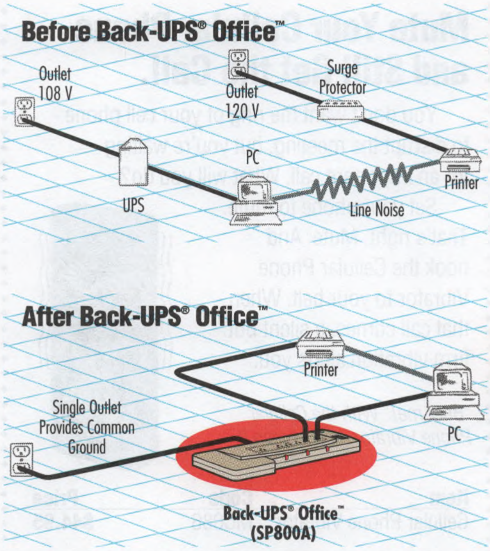
"I have a complete home office. I know I need surge protection and should have backup power. Any ideas that won't break my meager budget?"

This Solution Is Affordable and Absolutely Reliable—*Guaranteed!*

Black Box and APC® teamed up to bring you the world's most reliable power protection. The Back-UPS® Office™ (**page 58**) provides instantaneous battery backup power and full-time surge suppression in one small strip! You'll get:

- Full-time surge suppression for up to six devices (your modem, monitor, PC, fax, phone, etc.).
- Complete backup battery power for three devices such as your CPU, phone, and modem.
- Internet-ready fax/modem protection. Just plug in your phone line.
- A $25,000 Lifetime Equipment Protection Guarantee.

And, at only $199.95, the Back-UPS® Office™ is truly a bargain.



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FOR *FAST* TECH SUPPORT,
Call **412-746-5500**, then...

PRESS **1,2,3** COMMUNICATIONS
Modems, CSU/DSUs, ISDN, T1, X.25/Frame Relay, Muxes/Line Sharing, Line Drivers, Video & Multimedia, **PC Communications/Accessories**

Or if You Prefer:
Fax Us at: 412-746-0746.
E-mail Us at: info@blackbox.com

Black Box Has *All* the Accessories for

Cellular Phone Accessories

Motorola Micro TAC and Micro TAC Lite Nickel-Cadmium Battery (MC069).

Ericsson/GE® Nickel-Cadmium Battery (MC079).

Powercord PLUS Phone Charger (MC061A).

Like all of our Leather Cases, MC067 for Ericsson/GE (left) clips onto your belt for a snug fit.

Access all of your phone's features, with MC065.

CONDITIONING CHARGING
STAND BY FAULT

MC088's indicators highlight your Ericsson/GE battery's charge status.

Extended Batteries

Talk about extended talk time!

Use your cell phone for up to 60, 90, even *130 minutes* on just one charge—with our Extended Batteries.

Nickel-Cadmium batteries are the most popular cell-phone batteries. It's best to recharge them only when they're fully discharged. Otherwise, they'll suffer from "memory effect" and will require conditioning.

Nickel-Metal Hydride (NiMH) batteries, however, can be consistently topped off to full power and not suffer memory effect. This is perfect for people who use their cell phone with a power cord in their vehicle. The chart on the **next page** shows which battery you need.

Power Cords

Keep your cellular phone's battery charged for when you *really* need it: when you're away from your vehicle.

Choose the right Power Cord for your Motorola®, Ericsson/GE®, or Nokia cellular phone. Refer to the handy chart on the **next page**.

Leather Cases

BLACK BOX® Leather Cases can *add* to the life of your cellular phone. Designed with style and ease of use in mind, our cases protect your phone from abrasion, dust, and dirt. Made from top-grade glove leather, each Case comes equipped with a belt clip for easy transport.

See the chart on the **next page** for the Case that's right for you.

Deluxe Conditioning Units

Extended Nickel-Cadmium and NiMH batteries already last a long time. But if you get a Deluxe Conditioning Unit, your cell phone's battery could last up to *three times as long!*

Black Box Conditioning Units use a sophisticated microprocessor-controlled charging method that ensures a *fast* charge and condition—in under an hour!

Our Conditioning Units are shipped with an AC/DC adapter. You can get quick, efficient charging from just about anywhere.

The chart on the **next page** points out which Conditioning Unit you need.

FAXBACK INFORMATION
For All These Cellular Accessories: 15420
Call 412-746-5500 Anytime

Cigarette Lighter Dual Adapter

Charge 'em Fast—and Hit the Highway.

Power up two things at once, with the Dual Adapter.

Rely on your cell phone? And your radar detector, too? Do we have the accessory for you!

The Cigarette Lighter Dual Adapter is the *perfect* outlet for simultaneously powering your cell phone *and* radar detector's battery charger.

Your accessories charge fast, too. They power up while you're at lunch or making one sales call. In just an hour, they're charged up and you're ready to hit the highway.

Item	Code	Price
Cigarette Lighter Dual Adapter	MC092	$6.95

Cellular Phone Vibrator

Mute Your Cellular Phone and Still Get the Call.

You don't want the ring of your cell phone to disrupt the meeting, but you're waiting for an important call. What will you do?

Set your phone to mute. That's right. Mute. And hook the Cellular Phone Vibrator to your belt. When that call comes, a silent but firm vibration alerts you.

CELLULAR PHONE VIBRATOR

"Buzz me!" With the Cellular Phone Vibrator, you'll mean it.

Item	Code	Price
Cellular Phone Vibrator	MC086	$44.95

FAXBACK INFORMATION
For the Cigarette Lighter Dual Adapter, the Cellular Phone Vibrator, and the Hands-Free Car Kit: 15437
Call 412-746-5500 Anytime

Hands-Free Car Kit

Keep Your Hands on the Wheel, Not on the Phone.

The Kit's microphone provides optimum voice transfer and eliminates background noise.

Ever notice what vehicular hazards mobile cell phone users are? With their necks craned and only one hand on the wheel, how can they possibly drive safely? With the Hands-Free Car Kit.

The Hands-Free Car Kit comes with a microphone that plugs into your cell phone—you can carry on a conversation *and* keep both hands on the wheel. The Kit can also charge your phone's battery, with current from your vehicle.

NOTE: For Motorola phones only.

Item	Code	Price
Hands-Free Car Kit	MC089	$99.95

Cellular Phone Communications!

CELLULAR PHONE ACCESSORIES BUYING GUIDE

	Extended Batteries						
Cellular Phone	Nickel-Cadmium		NiMH (Longer-Life)		Power Cord	Leather Case	Conditioning Unit
Motorola® **Micro TAC® Flip Phone**	MC069 (Dark Gray)	MC070 (Steel Gray)	MC071 (Dark Gray)	MC072 (Steel Gray)	MC061A	MC065	MC060A MC087 (Deluxe)
Micro TAC Flip Phone Lite	MC069 (Dark Gray)	MC070 (Steel Gray)	MC071 (Dark Gray)	MC072 (Steel Gray)	MC061A	MC066	MC060A MC087 (Deluxe)
Ericsson/GE® **CT500/700**	MC079		MC080		MC062	MC067	MC088
Nokia **100/228/232/2120** **101/121/128/201/1000**	MC081 MC082				MC063 MC063	MC073	

Item		Code	Price
Extended Batteries			
Motorola Micro TAC & Micro TAC Lite			
Nickel-Cadmium	Dark Gray	MC069	**$44.95**
	Steel Gray	MC070	**$44.95**
Nickel-Metal Hydride (NiMH)	Dark Gray	MC071	**$62.95**
	Steel Gray	MC072	**$62.95**
Ericsson/GE			
Nickel-Cadmium		MC079	**$44.95**
NiMH		MC080	**$62.95**
Nokia 100/228/232/2120			
Nickel-Cadmium		MC081	**$44.95**
Nokia 101/121/128/201/1000			
Nickel-Cadmium		MC082	**$44.95**

Item	Code	Price
Power Cords		
PowerCord PLUS Phone Charger	MC061A	**$39.95**
For Ericsson/GE Phones	MC062	**$32.95**
For Nokia Phones	MC063	**$32.95**
Leather Cases		
Motorola DPC500 Flip Series	MC065	**$24.95**
Motorola Micro TAC Lite Series	MC066	**$24.95**
Ericsson/GE CT500/700	MC067	**$24.95**
Nokia 101/121/128/201/1000	MC073	**$24.95**
Deluxe Conditioning Units		
Motorola Rapid Charger/Conditioner	MC060A	**$59.95**
Deluxe Unit for Motorola	MC087	**$99.95**
Deluxe Unit for Ericsson/GE	MC088	**$99.95**

◆ ◆ ◆

Power Inverters

Run AC from Your Vehicle's Cigarette Lighter—Power Laptops, Lights, Even Small Appliances!

You have the power! Run AC-powered equipment and appliances from your car!

Where will you be when you'll wish you had a BLACK BOX® Power Inverter?

- In a traffic jam, wishing you could work on your batteryless laptop?
- By the roadside, wishing you could use that overhead light for a quick fix-it?
- At a campsite, wishing you could listen to your radio or turn on a lamp?

Your wishes are granted.

Our Power Inverters convert your vehicle's 12-VDC power to 110 VAC, for a constant supply of 50 or 150 watts of AC power. Our 150-Watt Inverter even shuts itself off when your vehicle's battery gets low.

FAXBACK INFO
Request Document Number: 15444
Call 412-746-5500
Anytime

Item	Code	Price
Power Inverter, 50 Watts	MC090	**$69.95**
150 Watts	MC091	**$99.95**

Cellular Data Interface

Modem Crucial Data from Anywhere over the Cellular Phone Network!

Why wait until you arrive at the office or hotel to send data? Send it from anywhere, with the Cellular Data Interface.

Inside, outside, poolside, or roadside—send or receive data from nearly any *remote location,* with the Cellular Data Interface.

The Cellular Data Interface immediately connects you with the cellular phone network—and frees you from relying on office or residential phone lines for data communications.

Simply connect the Interface to a modem-equipped computer and cellular phone, and you're ready to go to work.

The Interface comes with cables to connect it to your computer and to your Motorola cell phone.

FAXBACK INFO
Request Document Number: 15451
Call 412-746-5500
Anytime

Item	Code	Price
Cellular Data Interface for Motorola	MC085	**$299.95**

BLACK BOX® +

We Have 'em!—The World's Best-Selling Family of Modems.

Sportster® 33.6 Modem

Access the Internet at 33.6 Kbps—Software Included!

U.S. Robotics
X
TECHNOLOGY
Upgradable
U.S. Robotics
Sportster 33.6 Faxmodem
New
CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!

- **Upgrade to x2™ via Flash ROM.**
- **Includes CD-ROM software.**

Black Box now carries the world's best-selling 33.6-Kbps desktop modem, the Sportster 33.6 (000839-0) by U.S. Robotics®.

Work the Web over regular analog phone lines at 33.6 Kbps—or download at up to 56 Kbps with an x2 upgrade! The Sportster 33.6 features convenient front-panel LEDs for at-a-glance status checks. And it comes with the *Connections*™ CD-ROM, a collection of fax and Internet access software, multimedia demonstrations, plus product and support information.

For the most reliable links, order the Sportster 33.6 Ready Pak. It includes a 10-foot Serial Cable (BC00302) and a DB9/DB25 Adapter (FA521A). You're ready to hit the Info Highway as soon as the Sportster comes out of the box!

SPECIFICATIONS

Fax Standards — V.17 Group III
Maximum Speed — Line: 33.6 Kbps;
Download: 56 Kbps with x2;
DTE: 115.2 Kbps;
Fax: 14.4 Kbps
Modem Standards — ITU-T: V.34, V.32 bis, V.32, V.22 bis, V.22, V.21;
Bell: 212A, 103
Operation — Asynchronous
Interface — RS-232
Connectors — (1) DB25 female, (2) RJ-11 female
Power — 115 VAC, 50 Hz
Size — 1.5"H x 6.5"W x 3.8"D (3.8 x 16.5 x 9.7 cm)

FAXBACK INFORMATION
Request Document Number: 18959
Call 412-746-5500 Anytime

Item	Code	Price
Sportster 33.6 Modem	000839-0	**$169.95**
Sportster 33.6 Modem Ready Pak Includes the Modem (**1**)10-ft. Serial Cable, **and** (**1**) DB9M to DB25F Adapter	000839-0-CABPAK	**$179.95**

Sportster® Modem 56K

Now Download at 56 Kbps—Software Included!

- **Download files fast with x2 technology.**
- **Includes CD-ROM software.**

The U.S. Robotics family of high-speed fax-modems are the world's best-selling data communications solutions for small business, home office, and personal use. And now Black Box carries three new Sportster® Modems that can deliver 56-Kbps download speeds!

The Sportster® 56K Modems are available in Internal and External versions, as well as one that's Macintosh® compatible.

The Internal and External versions are compatible with DOS and Windows® 95. And they come with the *Connections*™ CD-ROM, a collection of fax and Internet access software, multimedia demonstrations, plus support information.

The Mac® compatible Sportster also comes with an Internet connection kit. It can transmit data from the Macintosh® to any other fax device and print to any laser printer. Plus it can convert received faxes to PICT, TIFF, or Paint formats for printing or importing into other documents.

For convenience, order the Sportster 56K Ready Pak. It includes a 6-foot Serial Cable (EVMBMC) with one DB25M and one DB9F connector.

SPECIFICATIONS

Fax Standards — V.17 Group III
Line Type — Dialup, 2-wire leased line
Maximum Speed — Connecting: Up to 33.6 Kbps;
Downloading: Up to 56 Kbps;
Fax: 14.4 Kbps
Modem Standards — x2™ 56K;
ITU: V.34, V.FC, V.32 bis, V.32, V.29, V.27, V.23, V.22 bis, V.22, V.21;
Bell: 212A, 103
Operation — Asynchronous
Interface — RS-232
Connectors — (1) DB25 female, (2) RJ-11 female
Power — 115 VAC, 60 Hz
Size — 1.5"H x 6.5"W x 3.8"D (3.8 x 16.5 x 9.7 cm)

For Internet workstation protection, order the Power Cruise Solution Pak. It includes a Sportster 56K Modem, and an APC® Back-UPS® Office™ uninterruptible power supply/surge protector. For more information on the Back-UPS Office, see **page 58**.

FAXBACK INFORMATION
Request Document Number: 18210
Call 412-746-5500 Anytime

New
U.S. Robotics
X
TECHNOLOGY
U.S. Robotics
Sportster Faxmodem with x2
56k
CERTIFIED
READY PAK
ALL CABLES INCLUDED!
PRODUCTIVITY
SOLUTION PAK
NEW WAYS TO WORK!
AVAILABLE!

Item	Code	Price
Sportster® 56K		
Internal	001787	**$199.95**
External	001786	**$219.95**
Mac®	001789	**$219.95**
Sportster 56K Modem Ready Pak Includes the External Modem **plus** (**1**) 6-ft. Serial Cable	001786-CABPAK	**$237.90**
Power Cruise Solution Pak Includes the External Modem, (**1**) Back-UPS®, **and** (**1**) DB9M to DB25F Adapter	BD1050A	**$419.90**

USRobotics® = the best!

U.S. Robotics® PC Cards

Make Clear, Easy, and Fast Connections from Anywhere.

New

- Compatible with most popular notebooks PCs
- Includes data/fax software for Windows®.
- Sportster 33.6 is upgradable to x2™ and Megahertz® 56K downloads twice as fast as V.34!
- Megahertz 33.6 connects to cellular phone lines. One version even connects to both cellular *and* 10BASE-T.
- Megahertz Cards also feature Digital LineGuard, which protects them from damage if plugged into a digital PBX phone line.

FAXBACK INFORMATION
Request Document Number: 18241
Call 412-746-5500 Anytime

SPECIFICATIONS

Compatibility — PCMCIA Slot Types II and III
Fax Standards — V.17 Group III
Modem Standards — SP1336, XJ1560: ITU: V.34, V.FC, V.32 bis, V.32, V.23, V.22 bis, V.22, V.21; Bell: 212A, 103; Hayes® AT command set; XJEM3336T: ITU: V.34, V.32 bis, V.32, V.22 bis, V.22, V.21; Bell: 212A, 103; Hayes AT command set; XJ4336: ITU: V.34, V.32 bis, V.32, V.23, V.22 bis, V.22, V.21; Bell: 212A, 103; Hayes AT command set
Operation — Asynchronous
Speed — Connecting: Up to 33.6 Kbps; Downloading: SP1336, XJ1560: Up to 56 Kbps; XJEM3336T, XJ4336: Up to 33.6 Kbps; Fax: Up to 14.4 Kbps
Connectors — (1) 68-pin PCMCIA Release 2.0; internal DAA
Power — From the interface
Size — 3.4"H x 2.1"W x 0.2"D (8.6 x 5.3 x 0.5 cm)

Item	Code	Price
Sportster 33.6 PC Card (x2 Upgradable)	SP1336	**$229.00**
Megahertz PC Card		
33.6 (Cellular with XJACK)	XJ4336	**$249.95**
33.6 (Cellular and 10BASE-T)	XJEM3336T	**$349.00**
56K	XJ1560	**$269.00**
remember to order cables Cell Cable (Motorola® MicroTAC®)	52683	**$34.95**

Cell Cable connects XJ4336 Card to your cellular phone. It supports a wide variety of Motorola MicroTAC, Pioneer®, and JVC® cellular phones. Other phone cables are available—call Technical Support for more information.

Globe-Trotter Solution Pak

The International Survival Pak for Globe-Trotting Professionals.

SOLUTION PAK

- **The Teleconnect Kit (MC165A) contains essential connectivity tools plus the most popular international power-plug and telephone adapters.**
- **The V.34-compliant, x2-enabled PC Card (XJ1560) connects to standard phone lines—and it's Plug-and-Play compatible with Windows® 95.**

Today you're flying to Rome. The next day, Paris. If you're a globe-trotter, this Solution Pak's Global Teleconnect Kit (MC165A) has all the right adapters and tools to connect your portable PC for modem links. It's the perfect companion to the Megahertz® PC Card (XJ1560)—get data rates to 56 Kbps and fax-transmission speeds up to 14.4 Kbps!

For more details, see **pages 54 and 399.**

SPECIFICATIONS

For Global Teleconnect Kit:
Communication Line — Standard telephone lines (PSTN)
Operation — Full- or half-duplex
Connectors — (1) RJ-11 female
Power — 9-V battery
Size — 7.7"H x 2"W x 2.2"D (19.6 x 5.1 x 5.6 cm)

For Megahertz 56K PC Card:
Compatibility — PCMCIA Type II and III
Fax Standards — V.17 Group III
Modem Standards — ITU-T: V.34, V.FC V.32 bis, V.32, V.23, V.22 bis, V.22, V.21; Bell: 212A, 103; Hayes AT command set

Item	Code	Price
Globe-Trotter Solution Pak Includes the Global Teleconnect Kit **plus** the Megahertz PC Card	BD1020A	**$568.00**

◆ ◆ ◆

Netscape Navigator 3.0

Netscape
The easy way to access the Internet
Netscape Navigator
Personal Edition

The Most Popular Browser for Exploring the Internet.

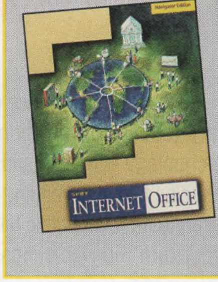
FAXBACK INFO
Request Document Number: 16438
Call 412-746-5500
Anytime

Item	Code	Price
Netscape® Navigator™ 3.0 Personal Edition	MDS100V-R3.0	**$49.95**

• NEW LOW PRICE $ • NEW LOW PRICE $ •

Internet Office

The Most Powerful Suite of Utilities for *Total* Internet Access.



FAXBACK INFO
Request Document Number: 16445
Call 412-746-5500
Anytime

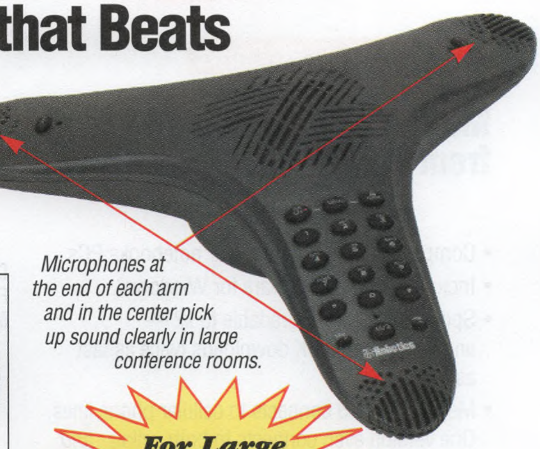
Item	Code	Was	NOW!
Internet Office™ 4.1 Navigator™ Edition	MDS200V-R4.1	~~$129.95~~	**$69.00**

While Supplies Last.

BLACK BOX® + USRobotics® = the best!

The High-Quality Conference Telephone that Beats All Speakerphones—Hands Down.

New



Microphones at the end of each arm and in the center pick up sound clearly in large conference rooms.

For Large Conference Rooms

ConferenceLink CS1050

The ConferenceLink™ CS1050 by U.S. Robotics® is a high-quality Performance™ Telephone that handles more than just regular conference calls.

Echo-cancellation technology and 360° coverage enables everyone in a large conference room to be heard—without clipped words, missed sentences, or one-way conversations. Conference calls are as smooth and interactive as face-to-face conversation! And since videoconferencing and Internet voice calls are becoming more common, the CS1050 can also be plugged into your PC.

Experience hands-free, full-duplex audio for videoconferencing by connecting the CS1050 to the sound card in your PC/desktop videoconferencing system. Or make full-duplex Internet or corporate intranet voice calls while running Internet telephony software.

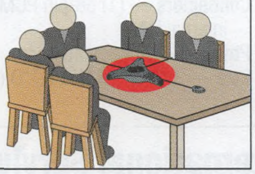
The CS1050 is easy to set up and features any-key answer, volume control, and mute keys.

FAXBACK INFORMATION
For ConferenceLink CS1050 and Extension Mics: 18928
Call 412-746-5500 Anytime

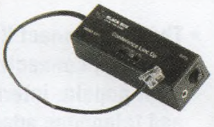
ConferenceLink Extension Mics

If your conference table is longer than 13 feet, or you have a large conference room, you need a pair of ConferenceLink Extension Microphones.

Simply attach them to your CS1050 and everyone will be heard loud and clear—even those people farthest from the ConferenceLink.



Each Mic comes with a 6-ft. cord and a mute key.



Connect the CS1050 to a digital phone system—see the Linc Up on ***page 416****. Or see our Conference Linc Up Solution Pak—***below!***

SPECIFICATIONS

For ConferenceLink CS1050:
Audio Bandwidth — 300–3400 Hz
Line Type — Analog PBX/PSTN
Volume Control Range — ±12 dB
Power — 120 VAC, 60 Hz, 100-mA current; Adapter Input: 20-VAC, 500-mA current
Size — 2.3"H x 7" Radius (2.3 x 17.8 cm)
Weight — 1.3 lb. (0.6 kg)

Item	Code	Price
ConferenceLink CS1050	CS1050	**$399.95**
Extension Mics	XM1000	**$49.95**

Conference Linc Up Solution Pak

Connect Your ConferenceLink Phone to Your Digital Phone System!

- Connect your ConferenceLink CS1050 to a digital PBX system.
- Easy to install—just plug the Linc Up (MC117A) into the handset jack of a PBX phone.
- Full-duplex technology for smooth, two-way conversations.

For more information on the Linc Up, see **page 416**.

SOLUTION PAK

SPECIFICATIONS

For Linc Up:
CE Approval — MC117A
Power — 115 VAC, 60 Hz from AC adapter (230-VAC, 50-Hz version on request)
Size — 3.7"H x 1.3"W x 1.1"D (9.5 x 3.5 x 3 cm)
Weight — 0.2 lb. (0.1 kg)

Item	Code	Price
Conference Linc Up Solution Pak Includes the Conference Link CS1050 **plus** the Linc Up	BD1000A	**$538.95**

Black Box Explains...

Echo Cancellation.

Traditional speakerphones use half-duplex technology which forces people on both ends of the line to conduct "my-turn, your-turn" conversations. And if you've ever sat in on one of these types of conference calls, you know it's all very unnatural.

But now, conference calls can be as natural as face-to-face conversation. SimulCom™ full-duplex technology with acoustic echo cancellation enables teleconferencing participants to hear everything, even while talking. Those "my-turn, your-turn" conversations are a thing of the past.

Echo cancellation eliminates confusion from clipped sentences, long pauses, and missed words. And since echo cancellation is full-duplex, background noises don't interrupt your voice transmissions.

ConferenceLink CS850

The Conferencing Power of Big Business for Your Desktop or Small Meeting Room.

USRobotics®
The Intelligent Choice in Information Access

- **Full-duplex audio delivers smooth-flowing, two-way conversations.**
- **Connects to your PC's full-duplex sound card for desktop videoconferencing and Internet voice calls.**

For the Office or Small Meeting Room
New
USRobotics

Give your home office or small company the conferencing power of a big business.

The CS850 delivers full-duplex audio for smooth, two-way conversations. And it makes videoconferencing or Internet voice calls accessible to a wider range of business consumers who want to upgrade their offices affordably. Echo cancellation technology and 360° coverage enables everyone in the room to be heard.

ConferenceLink CS850 is easy to set up—no DIP switches or user-tuning required! And its compact size takes up very little space on your desktop. The CS850 also features any-key answer, volume control, and a mute key.

SPECIFICATIONS

Audio Bandwidth — 300–3400 Hz
Line Type — Analog PBX/PSTN
Volume Control Range — ±12 dB
Power — 120 VAC, 60 Hz, 100-mA current; Adapter Input: 9-VAC, 1000-mA current
Size— 3.1"H x 8"W x 6.5"D (7.9 x 20.3 x 16.5 cm)
Weight — 1 lb. (0.5 kg)

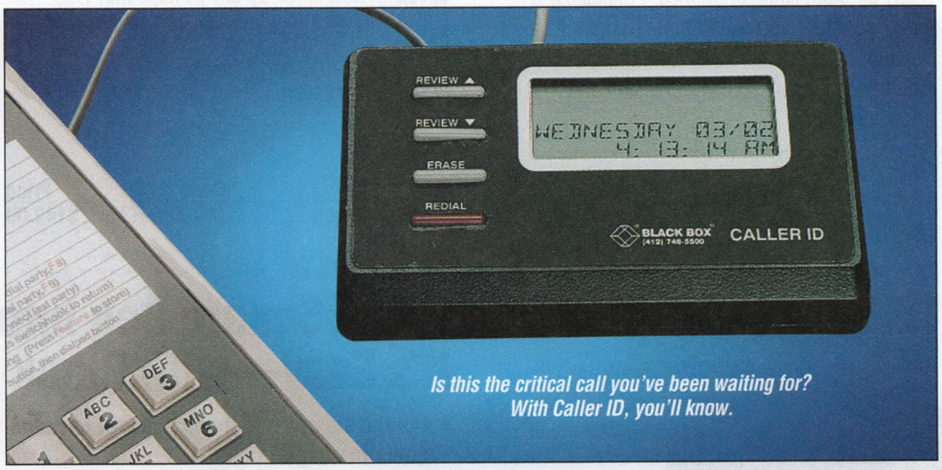
FAXBACK INFORMATION
Request Document Number: 18935
Call 412-746-5500 Anytime

Item	Code	Price
ConferenceLink CS850	CS850	**$299.95**

Caller ID

Find out *Before* You Pick up the Phone.

- **Identify callers before you answer.**
- **Assign special rings for certain callers.**



Is this the critical call you've been waiting for? With Caller ID, you'll know.

BLACK BOX® Caller ID connects between your phone and your phone line to let you know who's calling even before you answer. The LCD screen displays the caller's name, telephone number, and the date and time of the call.

Caller ID also serves as a mini answering machine, keeping record of the last 50 calls whether you answered or not. Use the Review keys to scroll back through your calls to locate a particular number. Or return a call displayed on the LCD screen with the touch of a button.

¿Habla español? Parlez-vous français? Then you'll also want Caller ID. It displays messages in Spanish and French, as well as English.

No matter the language, Caller ID can tell you the type of phone call you receive as well. Find out at a glance if you'll be asked to pay for toll charges, or if the party is calling from outside your area. Caller ID can even show you where to reach a caller who's used call forwarding services.

You can arrange Caller ID for desk display or mount it on a wall for convenient viewing.

FAXBACK INFORMATION
Request Document Number: 13545
Call 412-746-5500 Anytime

SPECIFICATIONS

Power — Requires 4 AAA batteries, not included
Size — 1.5"H x 6"W x 3"D (3.8 x 15.3 x 7.6 cm)
Weight — 1.5 lb. (0.7 kg)

NOTE: Caller ID service is not available in every state. Before ordering, please call your local telephone company and ask about your area.

Item	Code	Price
Caller ID	FX500A	**$99.00**

Global Teleconnect Kit

The International Survival Kit for Globe-Trotting Professionals.

PRODUCTIVITY
SOLUTION PAK
NEW WAYS TO WORK!
AVAILABLE!
For more details, see p. 51.

- **Use your modem with phones anywhere!**
- **8 power adapters, 9 phone adapters.**

Traveling abroad? Without the right adapters, connecting your portable PC for modem or fax links can be impossible. Now get everything you need in this durable nylon case. Includes an adjustable High-Speed Telecoupler for acoustic links to virtually any phone handset. Supports data and fax speeds to 14.4 Kbps.

For convenience, order the Globe-Trotter Solution Pak. It includes the Global Teleconnect Kit and a USR® Megahertz 28.8/33.6 PC Card Modem (XJ1288). For more information on the Megahertz 28.8/33.6 PC Card, see **page 51**.

What's in the Global Teleconnect Kit:

- **High-Speed Telecoupler**
- **Merlin® Phone Adapter**
- **(8) Power Plug Adapters**
  - —Multinational to US
  - —US 3-prong to 2-prong
  - —US Grounded 3-to-1 Power Tap
  - —US to Australia/New Zealand
  - —US to Europe/Middle East
  - —US to North/South America
  - —US to UK
  - —US to UK/Africa/Hong Kong
- **(9) Phone Adapters**
  - —France Modular
  - —Germany "F" Type
  - —Germany "N" Type
  - —Modular Inline (US)
  - —Modular T (US)
  - —Netherlands Modular
  - —Sweden Modular
  - —UK In-line (BT-431A Type)
  - —UK In-line (RJ-11 Type)
- **And a neat, durable nylon case**

FAXBACK INFORMATION
Request Document Number: 13459
Call 412-746-5500 Anytime

CE Approval — Yes

Item	Code	Price
Global Teleconnect Kit	MC165A	**$299.00**
Global-Trotter Solution Pak Includes the Kit **plus** the Megahertz PC Card	BD1020A	**$518.95**

• • • • • • • • • • • •

Phone Coupler II

Connect Your Laptop Modem or Fax to Any Phone.

- **Supports 14.4 Kbps via electronic phones, 2400 bps via US pay phones.**

When you're traveling, this could be your only link to the outside world. Because there are so many different kinds of phones—digital, hard-wired, square—you need Phone Coupler II.

Supports ITU standards for high-speed data transfer, even data compression and error correction.

FAXBACK INFORMATION
Request Document Number: 12771
Call 412-746-5500 Anytime

SPECIFICATIONS

Operation — Full- or half-duplex
Speed — Data or fax: up to 14.4 Kbps with V.42 and V.42 bis error correction/data compression
CE Approval — Yes
Connectors — (1) RJ-11 female
Power — 9-V battery

Item	Code	Price
Phone Coupler II	MC155A-R2	**$149.00**

• • • • • • • • • • • •

Acoustic Coupler Handset Adapter

Pop a Square Peg into a Round Hole? It's Easy—with Black Box Adapters.

- **Adapt a square telephone handset to round acoustic coupler cups.**
- **Synthetic rubber provides a superior fit for many different handsets.**

Get a tight fit on square telephones with BLACK BOX® Acoustic Coupler Handset Adapters. These Adapters fit a square telephone handset to a round modem coupler, giving you a tight acoustic link that reduces errors—and ensures safe data transmission and reception.

The Adapters' pliable synthetic rubber construction makes for a snug, yet flexible fit to almost any square telephone handset. And they tuck away in a corner of your briefcase.

SPECIFICATIONS

Material — Synthetic rubber
Size — 1.2"H x 2.5"W x 2.7"D (3 x 6.4 x 6.9 cm)
Weight — 0.1 lb. (<0.05 kg)

For simple, direct acoustic modem connections, these Adapters are your solution.

FAXBACK INFORMATION
Request Document Number: 13459
Call 412-746-5500 Anytime

Item	Code	Price
Acoustic Coupler Handset Adapter	MD001	**$10.20/pair**

The Eliminator

Protect Voice/Fax/Modem Calls from Accidental Phone Extension Pickups.

Eliminator

- **Protects modem/Internet sessions from accidental phone-extension pickups.**
- **Prevents unintended fax interruptions.**
- **Ensures private telephone conversations.**

If you're like most home- or small-office computer/fax/modem users, you have a single telephone line, and a number of extensions. And you've probably had the experience of sending a fax, transmitting over the modem, or surfing the Net and—WHAM!—someone picks up the extension. You're bumped!

End the frustration with The Eliminator.

Plug one into every phone extension you want to protect. Then enjoy uninterrupted and private phone, fax, and modem calls. The Eliminator actually blocks the extension phone connection. As soon as you hang up, all extensions are cleared.

Install in seconds. Just replace your phone, fax, or modem cable with The Eliminator's 7-foot (2.1-m) cable. Order one Eliminator for every phone extension you want to protect. Order in quantity packs and save!

> ***"The Eliminator saved my marriage! I was constantly getting disconnected from the Internet whenever my wife picked up a phone extension at home. Then I saw The Eliminator, ordered one, and have been smoothly surfing the Net ever since."***

FAXBACK INFORMATION
Request Document Number: 17484
Call 412-746-5500 Anytime

Item	Code	Price
The Eliminator		
1-Pack	FA100	**$14.95**
2-Pack	FA100-2	**$25.95**
6-Pack	FA100-6	**$70.95**

◆ ◆ ◆

Mobile RJ-11 Telephone Cable Interface

The Best Way to Carry Your RJ-11 Cable.

ABSOLUTELY GUARANTEED FOR LIFE

- **The compact solution for your RJ-11 cable requirements.**
- **Guaranteed for life.**

In a case the size of a PCMCIA card (smaller than an audio tape), the Mobile RJ-11 from Black Box stores 8 feet (2.4 m) of RJ-11 cable that easily extends and retracts like a tape measure. So when you want to attach your laptop's modem to a phone jack, just plug one end into the wall, pull out as much cable as you need, then plug the other end into your modem port. That's all there is to it.

FAXBACK INFORMATION
Request Document Number: 13473
Call 412-746-5500 Anytime

Item	Code	Price
Mobile RJ-11 Telephone Cable Interface	AC108	**$7.95**

◆ ◆ ◆

PCMCIA Storage Cases

Protect Your PCMCIA Cards from Harmful Dust and Debris.

- **Designed for Types I, II, and III PCMCIA cards.**
- **Durable vinyl and polypropylene cases protect your Cards from damage.**

These storage cases from Black Box are perfect for protecting your PCMCIA cards when you're on the go. SingleStore protects a single Type I or II Card in a vinyl case for easy storage and portability. SecureStore protects Type III Cards in a polypropylene case lined with thermoplastic rubber for superior shock absorption.

ABSOLUTELY GUARANTEED FOR LIFE

SecureStores

BLACK BOX
PCMCIA
Cellular 144

Item		Code	Price
PCMCIA Storage Cases			
SingleStore		AC103	**$3.95**
SecureStores	Green	AC109	**$5.95**
	Blue	AC106	**$5.95**
	Black	AC104	**$5.95**
	Red	AC105	**$5.95**

FAXBACK INFORMATION
Request Document Number: 13473
Call 412-746-5500 Anytime

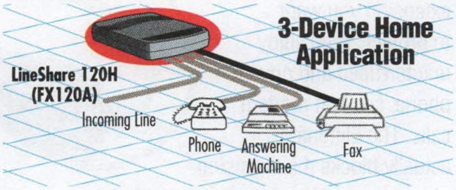
Why Pay for Multiple Phone Lines When One Will Do? Save BIG!

LineShare 120H Plug In Three Devices to Your Home Phone Line!

- **Connects three devices to one phone line.**
- **Talk *and* receive faxes during one call.**

Connect your telephone and answering machine—and your fax or modem—onto just one line, with the new LineShare 120H. Get security to stop junk faxes. You can even transfer from phone to fax to receive a document—all in the same call!

FAXBACK INFORMATION
Request Document Number: 18272
Call 412-746-5500 Anytime


3-Device Home Application
LineShare 120H (FX120A)
Incoming Line
Phone
Answering Machine
Fax

SPECIFICATIONS

Line Type — 2-wire dial
Operation — Full-duplex
Connectors — (4) RJ-11 female
Size — 2.3"H x 6.5"W x 7.3"D (5.8 x 16.5 x 18.5 cm)
Weight — 2.4 lb. (1.1 kg)

New
LineShare 120H
BLACK BOX

Item	Code	Price
LineShare 120H	FX120A	$89.95
remember to order cables RJ-11 Modular Cable, 14-ft. (4.3-m)	EL04M-14	$3.95

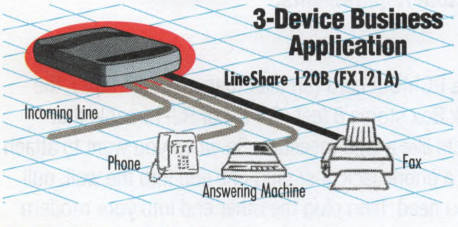
LineShare 120B Connect 3 Devices to Your Business Phone.

New
BLACK BOX

- **Automatic fax recognition.**
- **Works with distinctive ring service.**
- **Remote-message notification feature.**

Connect your telephone and answering machine, plus your modem or fax, to a single phone line—and have a special tone message forwarded to any desired number, so you don't miss an important call, fax, or e-mail message.

The new LineShare 120B works smoothly with distinctive ring service. It routes all calls directly to your connected devices, or it can be set so all extension phones will ring normally. And it also works with voice mail and Caller ID services.


3-Device Business Application
LineShare 120B (FX121A)
Incoming Line
Phone
Answering Machine
Fax

SPECIFICATIONS

Line Type — 2-wire dial
Operation — Full-duplex
Connectors — (4) RJ-11 female
Size — 2.3"H x 6.5"W x 7.3"D (5.8 x 16.5 x 18.5 cm)
Weight — 2.4 lb. (1.1 kg)

FAXBACK INFORMATION
Request Document Number: 18289
Call 412-746-5500 Anytime

Item	Code	Price
LineShare 120B	FX121A	$129.95
remember to order cables RJ-11 Modular Cable, 14-ft. (4.3-m)	EL04M-14	$3.95

LineShare 230B Connect 4 Devices To Your Business Phone, Even 2-Line Telephones.

- **Connect four devices to one phone line.**
- **Compatible with two-line telephones.**
- **Converts your fax into a scanner or printer.**

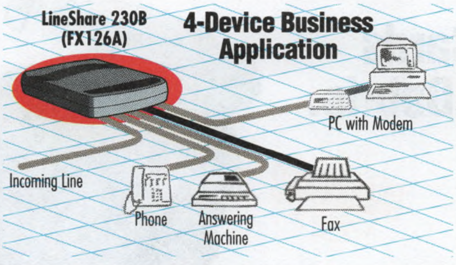
The new BLACK BOX® LineShare 230B enables you to connect your phone, answering machine, fax, *and* modem to a single telephone line. The 230B is even compatible with two-line phones—try and find *that* in somebody else's product!

You can also convert your fax into a full-page, multidocument scanner. Images are sent directly into your PC's fax/modem at the touch of a button! Reverse the process and your fax acts like a printer. Get all this *without* installing any software!

SPECIFICATIONS

Line Type — 2-wire dial
Operation — Full-duplex
Connectors — (5) RJ-11 female
Size — 2.3"H x 6.5"W x 7.3"D (5.8 x 16.5 x 18.5 cm)
Weight — 2.8 lb. (1.3 kg)

MORE! Phone-Line Sharers, see pp. 412–415.


LineShare 230B (FX126A)
4-Device Business Application
PC with Modem
Incoming Line
Phone
Answering Machine
Fax

FAXBACK INFORMATION
Request Document Number: 18296
Call 412-746-5500 Anytime

Item	Code	Price
LineShare 230B	FX126A	$189.95
remember to order cables RJ-11 Modular Cable, 14-ft. (4.3-m)	EL04M-14	$3.95

New
LineShare 230B
BLACK BOX

Check Out How You Can Save!

The "old" way:

A phone, modem, and fax are on three separate lines, each costing $30 per month. Your line expenses for one year total $1080!

The Black Box Way:

With the LineShare 230B, three devices can be put on one line to save you $60 a month! LineShare 230B pays for itself in less than three months!

Save $720 a year!

Good Vibrations! Pager System Discreetly Keeps You in Touch!

BUZZ! A customer is waiting for you!

BUZZ! You just received a new shipment for unloading!

BUZZ! The building inspector needs to see you!

Black Box Explains...

Private Pager Systems.

Private pager systems are great cost-savings alternatives to the high monthly charges often associated with subscription-based services.

However, there are limitations to private pager systems.

With FCC-imposed regulations on frequency and power, private paging systems are limited to short-distance applications with line-of-sight communication. In other words: The base unit's antenna must have a clear path to individual pager units. Major obstacles like buildings, steel structures, and hills cannot be in the way.

Private pager systems operate best outdoors, within warehouses, or on the same floor of a building.

To determine if a private pager system like the Campus Pager 1000 is right for your business, call Black Box Technical Support at **412-746-5500**.

FAXBACK INFORMATION
Request Document Number: 13026
Call 412-746-5500
Anytime

Campus Pager 1000

What's the Latest Buzz from Black Box? A Paging System for up to 1000 Users—with NO Monthly Service Charges!

- **Vibrating Pager provides a discreet option for staying in touch.**
- **Send message codes to pagers up to 2 miles (3.2 km) from the base unit.**
- **The Pager's back-up memory stores last eight page codes received.**
- **Perfect for offices, automobile dealers, stores, restaurants, and construction sites!**
- **Field-operable! Connects to 12-VDC power from your vehicle's cigarette lighter!**

Campus Pager 1000 has vibrating pagers so you can discreetly stay in touch and not disrupt others. It supports up to 1000 pagers and up to 10 message codes. Its powerful 7-watt transmitter enables someone to be paged up to 2 miles away from the Base Unit.

You could pay up to $75 per pager plus a monthly fee just to stay in touch. But why not pocket those expenses with your own personal paging system?

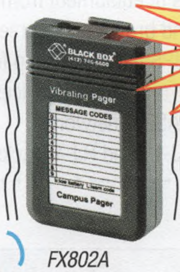
Campus Pager 1000 is also great for factories or campus settings. And it's a perfect amenity for shops or restaurants to beep or silently alert their customers.

> ***"Your Pager System is great! We have a 10-acre lot, and the pagers work everywhere. What a time saver!"***
>
> Rich Caswell, Sun Chevrolet
> McMurray, PA

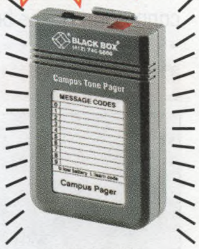
SPECIFICATIONS

RF Transmitting Power — 7 watts
Transmitting Frequency — 27.255 MHz
Power — Base Unit: 120 VAC, 60 Hz; or 12 VDC; Pagers: 2 AAA batteries (not included)
Size — Base Unit: 2"H x 6"W x 8.5"D (5.1 x 15.2 x 21.6 cm); Pagers: 3.5"H x 2.5"W x 1"D (8.9 x 6.4 x 2.5 cm)
Weight — Base Unit: 2.5 lb. (1.1 kg); Pagers: <0.1 lb (<0.1 kg)

Vibrating Pagers Available

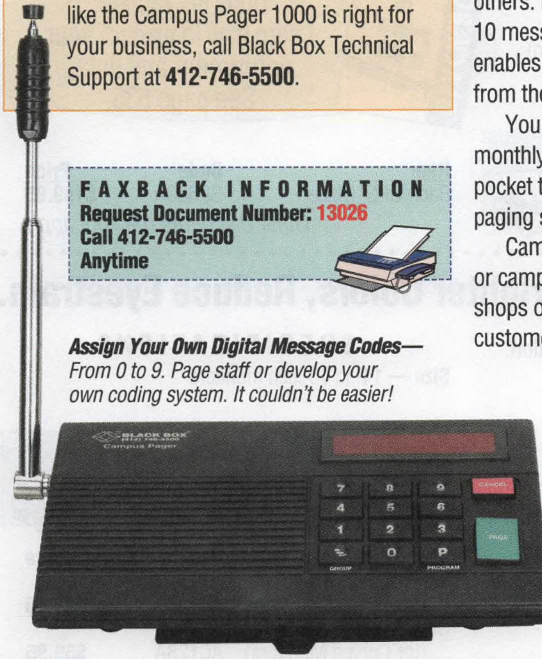


FX802A



FX801A-R2

Assign Your Own Digital Message Codes— *From 0 to 9. Page staff or develop your own coding system. It couldn't be easier!*



Broadcast one message to all pagers or customize a message for a select few. Each unit stores the last eight messages for quick reference.

Item	Code	Price
Campus Pager Base Unit	FX810A-R2	**$99.95**
Vibrating/Tone Pager	FX802A	**$59.95**
Tone Pager	FX801A-R2	**$45.95**
12-VDC Cigarette Lighter Adapter	PSA20	**$19.95**

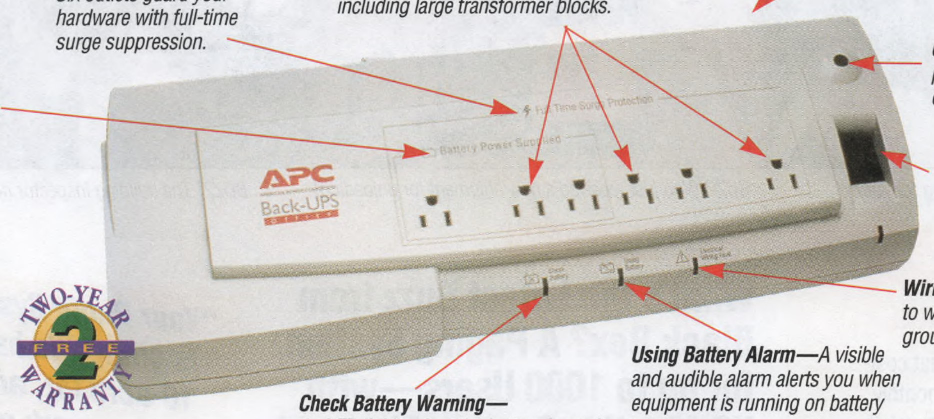
BLACK BOX® + APC = the best!

AMERICAN POWER CONVERSION

Internet and Network Workstation Protection

Back-UPS® Office™

Get Full-Time Surge Suppression *and* Backup Power—in One Small Strip!



UPS Power—*Three outlets provide instantaneous battery backup to keep your system from crashing in a blackout.*

Surge Suppression—*Six outlets guard your hardware with full-time surge suppression.*

Convenient BlockSafe™ Outlet Spacing—*Outlets accommodate all-size plugs, including large transformer blocks.*

Fax/Modem Protection—*Protect your phone line or network connection via built-in RJ-11 and RJ-45 jacks.*

Circuit Breaker—*Provides protection in the event of an overload or a short circuit.*

Recessed Master On/Off Switch—*Prevents accidental power-off.*

Wiring-Fault Indicator—*Alerts you to wiring problems, such as a missing ground and reversed polarity.*

Using Battery Alarm—*A visible and audible alarm alerts you when equipment is running on battery power.*

Check Battery Warning—*An LED lights when the battery is weak, giving you 6–8 weeks of warning.*

- **Protects up to six connected PCs, printers, modems, etc. against surges and spikes.**
- **Provides backup battery power for three connected devices, monitors, CPUs, etc.**
- **Get Internet-ready fax/modem protection.**
- **Compact design installs easily on desktop, floor, or mounts to the wall.**

Get instantaneous battery backup power *and full-time* surge protection—all in one. The APC® Back-UPS® Office™ looks like a surge protector, but it gives you a complete safety net for all your equipment: CPU, monitor, modem, fax, printer, and other equipment. You'll have up to 10 minutes to save data and perform an orderly shutdown.

Back-UPS® Office™ features six AC outlets so you can protect six pieces of equipment from surges, spikes, blackouts, and brownouts. Three of the six outlets also offer UPS battery backup for your connected PC, monitor, and storage devices. Protect your Internet or 10BASE-T network connection via the built-in RJ-11 and RJ-45 jacks.

The Back-UPS® Office™ also provides self-tests and LED signals to monitor battery life. The batteries are user-replaceable, and are easy to swap out. Batteries last 3–6 years under normal usage.

SPECIFICATIONS

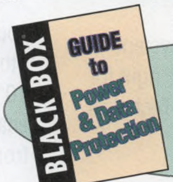
Runtime — 4 minutes with 250 VA load, longer with smaller load
Surge Capability — 240 joules, 0 ns
Connectors — (1) RJ-11 (telco), (1) RJ-45 (10BASE-T)
Indicators — (4) LEDs: on-line, using battery, electrical fault, replace battery;
Audible alarm: on battery, low battery, overload, replace battery
Power — 115 VAC, 60 Hz
Size — 2.7"H x 7.2"W x 16.9"D (6.9 x 18 x 43 cm)
Weight — 8 lb. (3.6 kg)

FAXBACK INFORMATION
Request Document Number: 17202
Call 412-746-5500 Anytime

LIFETIME EQUIPMENT PROTECTION

$25,000

FOR AS LONG AS YOU OWN THIS PRODUCT. IF YOUR PROPERLY CONNECTED EQUIPMENT IS EVER DAMAGED BY AN AC SURGE, INCLUDING SURGES DUE TO LIGHTNING, APC WILL REPAIR OR REPLACE OUR PRODUCT AND UP TO $25,000 OF CONNECTED EQUIPMENT. (SEE POLICY FOR DETAILS.)



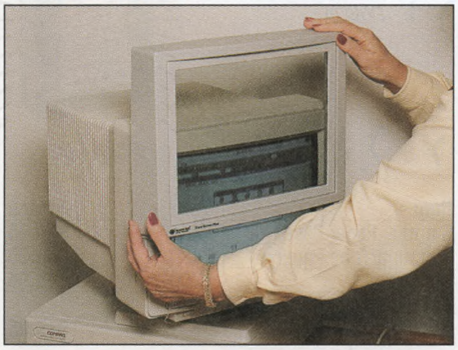
Don't get zapped! Learn how to protect your equipment and data. See page 635.

Item	Code	Price
Back-UPS® Office™	SP800A	$199.95

Other discounts may not apply.

Glare Screens

Easy on the Eyes: See Brighter Colors, Reduce Eyestrain.



- Virtually eliminate glare and ELF/VLF radiation.
- Conductive, antiglare coating draws away static and radiation.
- Accepted by the American Optometric Association.
- The Glare Screen+ features a wraparound design to give complete glare protection to a curved monitor.

SPECIFICATIONS

Size — 14- to 15-inch monitors

FAXBACK INFORMATION
Request Document Number: 14632
Call 412-746-5500 Anytime

Item	Code	Price
Glare Screen (for Flat Monitors)	AC127A	$39.95
Glare Screen+ (for Curved Monitors)	AC128A	$59.95

Above: Ergo Mouse Pad/Wrist Rest Set (AC124A)

Ergo Mouse Pad • Ergo Wrist Rest

Wave Goodbye to Wrist Stress and Fatigue.

- **Revolutionary new "wave" design reduces the risk of carpal tunnel syndrome.**
- **Contoured to the wrist's natural curves for maximum comfort.**
- **Available in three colors.**
- **Curved edges prevent fraying.**
- **Completely washable for a longer life.**

Working on a computer for hours at a time is often a fact of life. You've probably already felt stress and pain in your hands and arms. That's because standard, flat mouse pads and wrist rests don't elevate the wrist enough to counteract the effects of repetitive motion and improper hand/wrist placement. And *that* can lead to carpal tunnel syndrome.

Relieve that stress with the Ergo Mouse Pad and Wrist Rest. You rest your hands and wrists on a series of ergonomically designed curves.

For maximum comfort, the wave is designed to fit the wrist's natural contours.

SPECIFICATIONS

Construction — Neoprene rubber, plastic laminate

Size — Mouse Pad: 0.9"H x 7.8"W x 9"D (2.3 x 19.8 x 22.9 cm);
Wrist Rest: 0.9"H x 18"W x 2.9"D (2.3 x 45.7 x 7.4 cm)

Weight — 0.2 lb. (<0.1 kg)

This patented design is not only more comfortable than flat surfaces, but also prevents fraying—adding years to the life of your Mouse Pad or Wrist Rest.

Just like your keyboard, mouse pads and wrist rests pick up dirt. The Ergo Mouse Pad and Wrist Rest are completely washable, unlike others which soak up water and never really dry.

Save money and improve your comfort by ordering the set.

FAXBACK INFORMATION
Request Document Number: 14625
Call 412-746-5500 Anytime

Item	Code	Price
Ergo Mouse Pad		
Green	AC118A	**$16.95**
Gray	AC119A	**$16.95**
Blue	AC120A	**$16.95**
Ergo Wrist Rest		
Green	AC121A	**$16.95**
Gray	AC122A	**$16.95**
Blue	AC123A	**$16.95**
Ergo Mouse Pad/Wrist Rest Set		
Green	AC124A	**$31.95**
Gray	AC125A	**$31.95**
Blue	AC126A	**$31.95**

• NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ •

Deluxe Computer Workstation

Our Strongest Portable Computer and Printer Desk.

Great Price

- **Modern Euro-design with ergonomic features.**
- **Supports up to 200 pounds (90 kg)!**
- **Assembles in just 15 minutes.**

ABSOLUTELY GUARANTEED FOR LIFE

Keep your desk clear—put your PC and accessories on the Deluxe Computer Workstation from Black Box. This strong "workstation on wheels" also provides an extended area for your mouse on either the left or the right side.

Item	Code	Was	NOW!
Deluxe Computer Workstation	AC117A	~~$189.95~~	**$129.95**

FAXBACK INFORMATION
For AC110A–AC112A, AC117A: 12630
Call 412-746-5500 Anytime

Desktop CPU/Keyboard Holder

Tuck Your Keyboard Away.

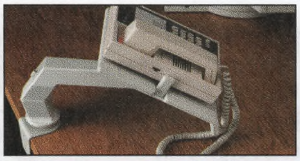
ABSOLUTELY GUARANTEED FOR LIFE

- Elevates monitor to comfortable viewing height.
- Fits standard and extended keyboards.
- Keyboard tray also provides wrist support.
- Durable steel construction.

Item	Code	Price
Desktop CPU/Keyboard Holder	AC111A	**$69.00**

Telephone Arm

Save Valuable Desk Space.



- Fits all phone sizes.
- Skid-resistant surface.
- Mounts on wall or desk.
- Swivels 360 degrees and extends up to 19.5 inches (49 cm).

ABSOLUTELY GUARANTEED FOR LIFE

Item	Code	Price
Telephone Arm	AC112A	**$39.95**

Under-Desk Keyboard Mover

Adjust Your Keyboard to the Height That's Exactly Right for You.

- Ergonomically designed for comfort.
- Extends 12 inches (30.5 cm) and rotates 360 degrees.
- Provides wrist support.

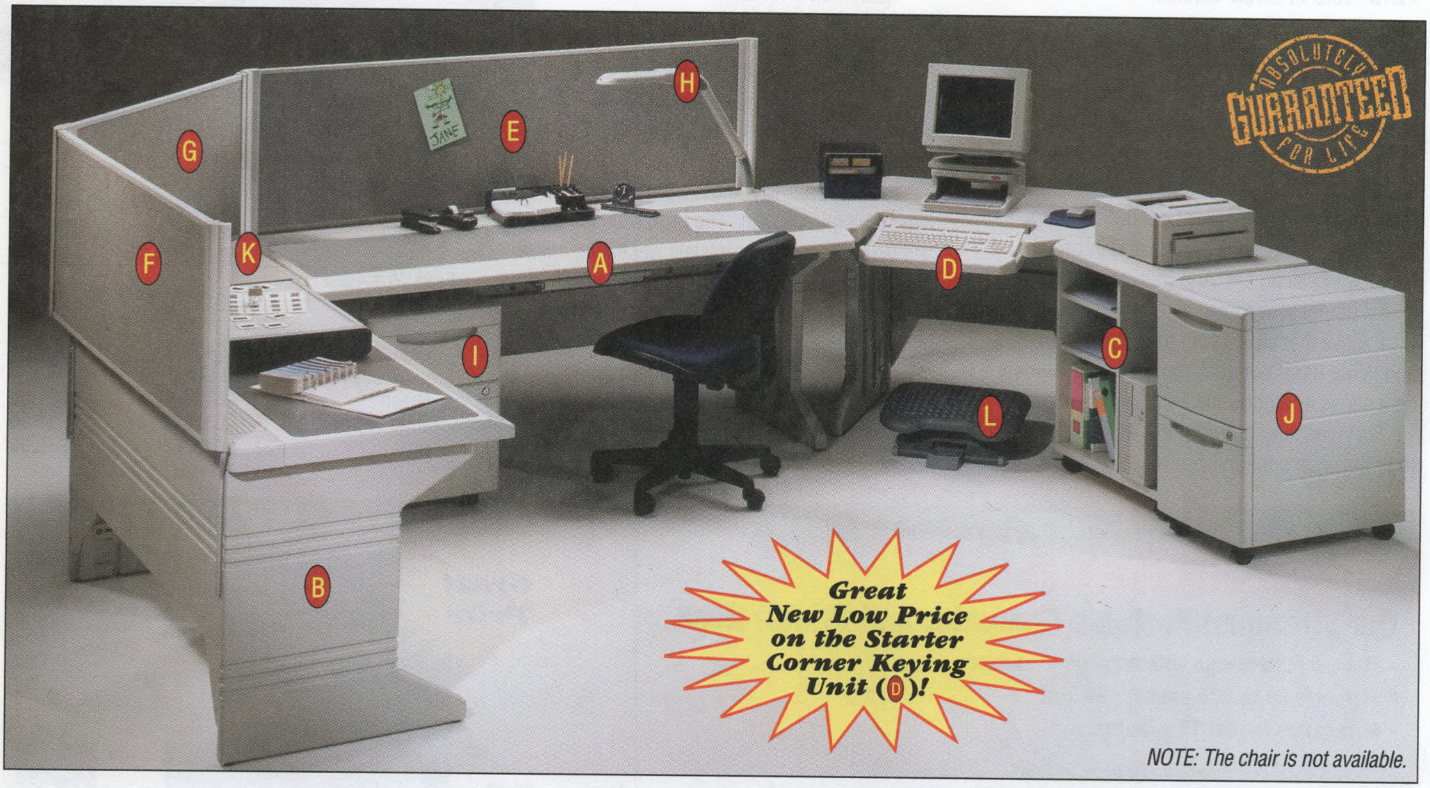
ABSOLUTELY GUARANTEED FOR LIFE

Item	Code	Price
Under-Desk Keyboard Mover	AC110A	**$99.00**

WorkManager™ Computer Desk Systems

Black Box Provides the Tools You Need

- No need to wait on your office furniture—we have same-day shipping!
- Competitively priced!
- Rubbermaid® WorkManager is designed for maximum efficiency and economy of space.
- Modular components enable users to construct their workstation quickly and easily and expand it as their requirements change.
- Structural components are fabricated from steel-reinforced resinite™ composite, which is strong, durable, lightweight, and resistant to scratches and chips.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ABSOLUTELY GUARANTEED FOR LIFE
Great New Low Price on the Starter Corner Keying Unit (D)!

NOTE: The chair is not available.

Desks

Comfortable, ergonomic design. Accessory sockets for privacy panels, task lights, and monitor attachment. Includes pencil drawer. Simple assembly required.

Color — Platinum
Size —
72-inch (not shown):
28.5"H x 72"W x 28"D
(72.4 x 182.9 x 71.1 cm);
60-inch:
Ⓐ 28.5"H x 60"W x 28"D
(72.4 x 152.4 x 71.1 cm);
48-inch:
Ⓑ 28.5"H x 48"W x 28"D
(72.4 x 121.9 x 71.1 cm);
34-inch (not shown):
28.5"H x 34"W x 28"D
(72.4 x 86.4 x 71.1 cm)

Item	Code	Price
Desks		
72-inch	AC3600V	**$379.95**
60-inch	AC3601V	**$329.95**
48-inch	AC3602V	**$299.95**
34-inch	AC3604V	**$239.95**

CPU/Laser Printer Tower Cart

Two-shelf mobile cart holds CPU, printer, and supplies. Cart has four casters (two locking). Simple assembly required.

Color — Platinum
Size —
Ⓒ 29.3"H x 24"W x 22"D
(74.4 x 61 x 55.9 cm)

Item	Code	Price
CPU/Laser Printer Tower Cart	AC3606V	**$249.95**

Corner Keying Unit

A cost-effective ergonomic solution for computing, with adjustable recessed keyboard platform. Includes accessory sockets, cable clips. Simple assembly required.

Color — Platinum
Size —
Ⓓ 28.5"H x 58.3"W x 34.5"D
(72.4 x 148.1 x 87.6 cm)

Item	Code	Price
Corner Keying Unit	AC3609V	**$239.95**

Special Price

Privacy Panels

Gray tweed fabric-covered tackboard. Creates privacy where needed.

Color — Platinum
Size —
72-inch (not shown):
(for use with 72" Desk)
20.3"H x 72"W x 1"D
(51.6 x 182.9 x 2.5 cm);
60-inch:
Ⓔ (for use with 60" Desk)
20.3"H x 60"W x 1"D
(51.6 x 152.4 x 2.5 cm);
48-inch:
Ⓕ (for use with 48" Desk)
20.3"H x 48"W x 1"D
(51.6 x 121.9 x 2.5 cm);
34-inch (not shown):
(for use with 34" Desk)
20.3"H x 34"W x 1"D
(51.6 x 86.4 x 2.5 cm)

Item	Code	Price
Privacy Panels		
72-inch	AC3615V	**$149.95**
60-inch	AC3612V	**$119.95**
48-inch	AC3611V	**$94.95**
34-inch	AC3613V	**$81.95**

Privacy Panel Corner Triangle

Gray tweed fabric-covered tackboard. Creates privacy where needed. For use on Corner Connector Triangle.

Color — Platinum
Size —
Ⓖ 20.3"H x 38.5"W x 1"D
(51.6 x 97.8 x 2.5 cm)

Item	Code	Price
Privacy Panel Corner Triangle	AC3614V	**$72.95**

Task Light

Mounts into corner accessory socket on desk units or with clamp. Includes articulating arm, fluorescent bulb, and desk clamp.

Color — Platinum
Size —
Ⓗ 36.5"H x 3.8"W x 1.5"D
(92.7 x 9.7 x 3.8 cm)

Item	Code	Price
Task Light	AC3620V	**$94.95**

to Turn Your Workspace into a UFO—User Friendly Office.℠

Layout Table

Scratch-resistant vinyl laminate top with 17 tilt positions from 0 to 40 degrees.

Color — Platinum
Size —
Base: 28.5"H x 48"W x 28"D
(72.4 x 121.9 x 71.1 cm);
Top: 28H" x 48W"
(71.1 x 121.9 cm)

Item	Code	Price
Layout Table	AC3603V	**$309.95**

Mobile Pedestals

File drawers accommodate letter, legal, foolscap, and A-4 folders. On casters (two locking). File drawer lock and two keys.

Color — Platinum
Size —
Underdesk (See p. 60)
Ⓘ (one file drawer and one box drawer):
24"H x 15.3"W x 22"D
(61 x 38.9 x 55.9 cm)
Desk-Height (See p. 60)
Ⓙ (two file drawers):
28"H x 15.3"W x 22"D
(71.1 x 38.9 x 55.9 cm)

Item	Code	Price
Mobile Pedestals		
Underdesk	AC3616V	**$219.95**
Desk-Height	AC3619V	**$219.95**

FAXBACK INFO
For All Rubbermaid WorkManager Computer Desk Systems: 14656
Call 412-746-5500
Anytime

Printer Stand

Free-standing. This stand conveniently locates printer off desktop. Steel shelves automatically refold paper. Simple assembly required.

Color — Platinum
Size —
28.5"H x 24"W x 28"D
(72.4 x 61 x 71.1 cm)

Item	Code	Price
Printer Stand	AC3605V	**$199.95**

Footrests

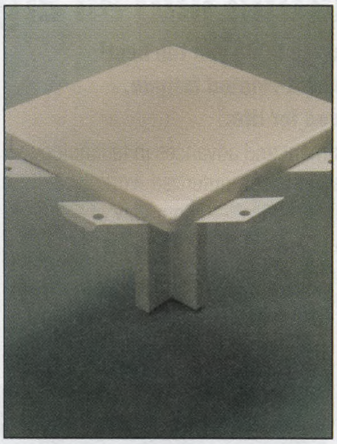
Provide relief from sitting at a computer for a long time.

FootEase™ Adjustable Footrest provides forward and back tilt adjustment for support to ankles, knees, hips, and back.

ComfortTread™ Plus Footrest tilts 15 degrees forward and back for comfortable support and lower limb exercise. Three height adjustments for perfect positioning.

Color —
FootEase™ Adjustable: Silver;
ComfortTread™ Plus: Gray
Size —
FootEase™ Adjustable: (above)
3"H x 19"W x 13"D
(7.6 x 48.3 x 33 cm);
ComfortTread™ Plus: (See p. 60)
Ⓛ 4.3 to 6.4"H x 18.3"W x 14.3"D
(10.9 to 16.3 x 46.5 x 36.3 cm)

Item	Code	Price
Footrests		
FootEase™ Adjustable	AC374V	**$59.95**
ComfortTread™ Plus	AC363V	**$42.95**

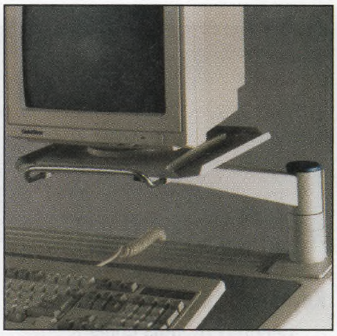


Corner Connectors

The Triangle Connector creates a cost-effective corner; the Square creates a slightly larger corner than the Triangle. Both must be used with a desk on each side.

Color — Platinum
Size —
Triangle: (See p. 60)
Ⓚ 2"H x 38.3"W x 28"D
(5.1 x 97.3 x 71.1 cm);
Square: (above)
28.5"H x 28"W x 28"D
(72.4 x 71.1 x 71.1 cm)

Item	Code	Price
Corner Connectors		
Triangle	AC3607V	**$89.95**
Square	AC3608V	**$169.95**

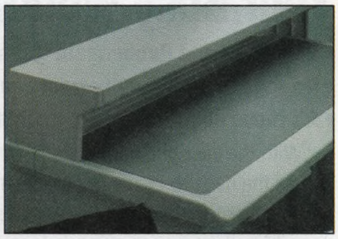


Monitor Arm

Mounts over built-in sockets in WorkManager™ furniture to lift, rotate, and tilt monitor. (Not compatible with Corner Keying Unit.)

Color — Platinum
Size —
22"H x 12.5"W x 20"D
(55.9 x 31.8 x 50.8 cm)

Item	Code	Price
Monitor Arm	AC3621V	**$105.95**

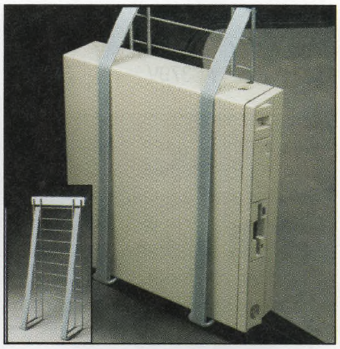


Unit Organizers

Steel shelf with durable, high-impact supports. Frees up desktop for current projects.

Color — Platinum
Size —
60-inch: (above)
(for use with 60" Desk)
7.5"H x 60"W x 12"D
(19.1 x 152.4 x 30.5 cm);
48-inch (not shown):
(for use with 48" Desk)
7.5"H x 48"W x 12"D
(19.1 x 121.9 x 30.5 cm);
34-inch (not shown):
(for use with 34" Desk)
7.5"H x 34"W x 12"D
(19.1 x 86.4 x 30.5 cm)

Item	Code	Price
Unit Organizers		
60-inch	AC3622V	**$132.95**
48-inch	AC3623V	**$124.95**
34-inch	AC3624V	**$121.95**



CPU Holder

For use with WorkManager™ Systems.

Color — Silver
Size —
22.8"H x 11"W x 5.5"D
(57.9 x 27.9 x 14 cm)

Item	Code	Price
CPU Holder	AC3610V	**$31.95**

MORE! Rubbermaid Accessories, just turn the page!

Black Box Brings You Computer Accessories to Turn Your Busy Workstation into an Ergonomic Workplace.

ABSOLUTELY GUARANTEED FOR LIFE

- **Black Box and Rubbermaid® team up to bring you the best!**
- **No sags in productivity from equipment-related fatigue.**
- **All these accessories are guaranteed for life.**

With the ever-changing work environment and advances in technology comes the need to create improvements in the computerized workplace. Turning an office into a UFO—User Friendly Office℠—is our way of describing the ergonomic workplace. Rubbermaid Office Products are designed to fit the user. And these computer accessories can be customized to fit existing or new workspaces.

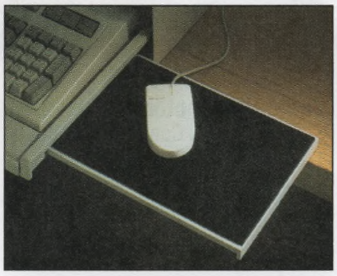
Keyboard Drawers/Mouse Pad Accessories

Underdesk Keyboard Drawer

Securely mounts under a desk, shelf, or tabletop and offers three heights when mounted. Holds keyboards up to 2.4 to 3.7"H x 20.5"W x 8.9"D (6.1 to 9.4 x 52.1 x 22.6 cm).

Color — Platinum
Size — 3–4.3"H x 23"W x 15"D
(7.6–10.9 x 58.4 x 38.1 cm)

Item	Code	Price
Underdesk Keyboard Drawer	AC379V	**$31.95**

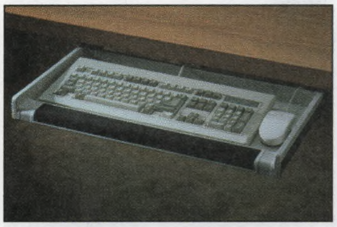


Mouse Tray

Keyboard and mouse surface stored together. Stores under the AC376V, AC378V, and AC379V keyboard drawers for right- or left-hand users.

Color — Platinum
Size — 0.9"H x 18.8"W x 9"D
(2.3 x 47.8 x 22.9 cm)

Item	Code	Price
Mouse Tray	AC380V	**$21.95**



SuperDrawer™ Underdesk Drawer

Holds wide keyboards plus a mouse. Includes built-in padded wrist rest and easy-glide, ball-bearing tracks. Clears the desktop, creating an ergonomic computer workstation without the usual clutter. Holds keyboard up to 3.3"H x 22.8"W x 10.5"D (8.4 x 57.9 x 23.8 cm).

Color — Platinum
Size — 2.5–4.3"H x 25"W x 15.3"D
(6.4–10.9 x 63.5 x 38.9 cm)

Item	Code	Price
SuperDrawer™ Underdesk Drawer	AC376V	**$64.95**

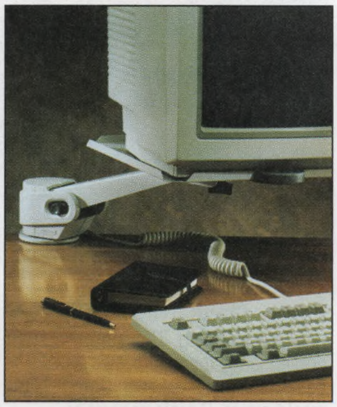
Height-Selectable Keyboard Drawer

Securely mounts under a desk, shelf, or tabletop and offers a choice of three preset typing heights. Includes padded wrist rest. Drawer opens out on easy-glide ball bearings and locks in place. Holds keyboard up to 3.3"H x 20.5"W x 10.5"D (8.4 x 52 x 26.7 cm).

Color — Platinum
Size — 2.5–4.3"H x 23"W x 15.3"D
(6.4–10.9 x 58.4 x 8.9 cm)

Item	Code	Price
Height-Selectable Keyboard Drawer	AC378V	**$59.95**

Monitor Supports



EasyVue™ Adjustable Monitor Arm

Three monitor positions. Base rotates fully and platform tilts and rotates to enhance viewing.

Color — Platinum
Size — 8.8"H x 11.4"W x 18.8"D
(22.4 x 29 x 47.8 cm)

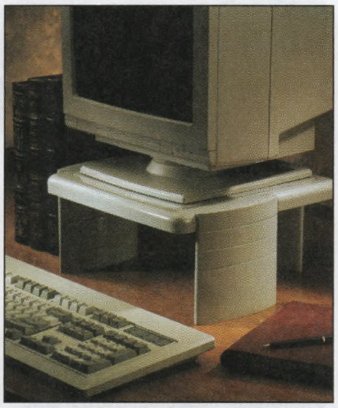
Item	Code	Price
EasyVue™ Adjustable Monitor Arm	AC372V	**$52.95**

EasyVue™ VDT Platform

Raises monitor 4" (10.2 cm) closer to eye level. Tray underneath stores papers, books, and small items.

Color — Platinum
Size — 4.3"H x 11"W x 14.8"D
(10.9 x 27.9 x 37.6 cm)

Item	Code	Price
EasyVue™ VDT Platform	AC373V	**$24.95**



Height-Selectable Monitor Holder

Adjusts to three heights from 4 to 6 inches above desk surface. Holds monitor up to 40 lb. (18 kg) with base up to 12 x 12 inches (30.5 x 30.5 cm).

Colors — Black, Platinum
Size — 6"H x 13.4"W x 12.7"D
(15.2 x 34 x 32.3 cm)

Item	Code	Price
Height-Selectable Monitor Holder		
Black	AC369V	**$24.95**
Platinum	AC382V	**$24.95**

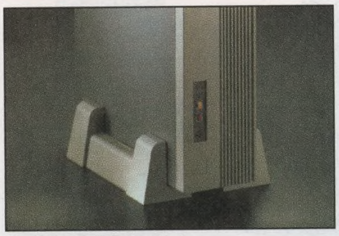
CRT Riser

Combination storage unit and monitor stand raises your CRT for optimum visibility. Swivels 360 degrees and tilts 12.5 degrees.

Color — Platinum
Size — 7.8"H x 12"W x 13.9"D
(19.8 x 30.5 x 35.3 cm)

Item	Code	Price
CRT Riser	AC368V	**$50.95**

CPU Stand • Cable Managers

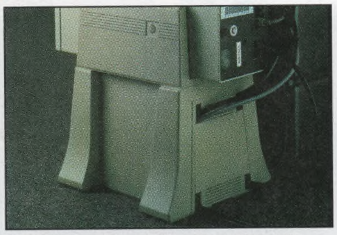


CPU Stand (Plastic)

Sturdy construction and padded sides grip CPU while protecting its finish. You get secure vertical placement of your CPU while maintaining easy access to the disk drives.

Color — Platinum
Size — 4"H x 7.5"W x 12"D
(10.2 x 19.1 x 30.5 cm)

Item	Code	Price
CPU Stand	AC366V	**$13.95**

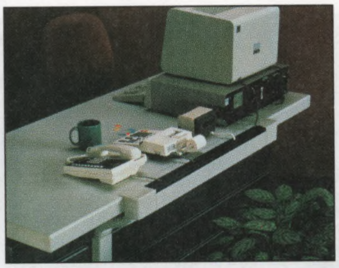


CPU SuperBase™ Vertical Stand

Holds the CPU vertically beside or under desk. Clamped to a 9-inch-high (29.9-cm) pedestal for easy access and safety from office traffic.

Color — Platinum
Size — 13.5"H x 11"W x 10.3"D
(34.3 x 27.9 x 26.2 cm)

Item	Code	Price
CPU SuperBase™	AC367V	**$44.95**

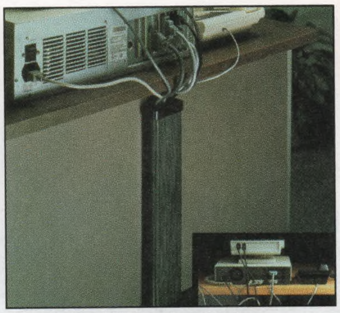


CableManager

Keeps cables safe, out of sight, and out of the way. Works on any desk.

Color — Platinum
Size — 36" wide (91.4 cm) end caps;
2.2"H x 28.5"W x 3"D
(5.6 x 72.4 x 7.6 cm)

Item	Code	Price
CableManager	AC362V	**$54.95**



Cable Duck™ Routing System

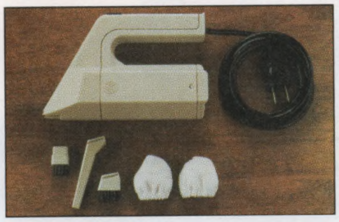
Organizes and routes cables safely downward, reducing tangling or tripping. No tools required.

Color — Dark brown
Size — 18"H x 4"W x 1.8"D
(45.7 x 10.2 x 4.6 cm)

Item	Code	Price
Cable Duck™	AC361V	**$10.95**

◆ ◆ ◆

Media Storage and Ergonomic Accessories



System Sweeper™ PC System Vacuum

Protect your keyboard, printer, and other computer components with this compact, powerful vacuum. Not to be used with laser printers or copiers (because of the fine graphite toner dust).

Color — Platinum
Size — 4"H x 2"W x 6.5"D
(10.2 x 5.1 x 16.5 cm)

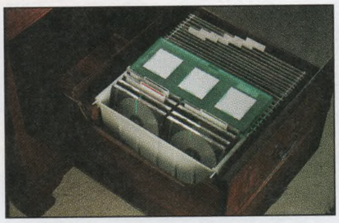
Item	Code	Price
System Sweeper™	AC377V	**$45.95**

Diskette Holder

Lockable space for 30 diskettes (3½") plus convenient fingertip access to 4 extra diskettes.

Color — Platinum
Size — 4.9"H x 4.9"W x 8.5"D
(12.5 x 12.5 x 21.6 cm)

Item	Code	Price
Diskette Holder	AC370V	**$8.95**



Hanging Multi-Media File

Locks and stores diskettes while saving desk space. Holds up to 80 diskettes (5¼" or 3½") or 20 CD-ROMs.

Color — Platinum
Size — 7"H x 12.8"W x 4.5"D
(17.8 x 32.5 x 11.4 cm)

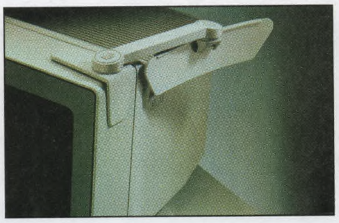
Item	Code	Price
Hanging Multi-Media File	AC375V	**$17.95**

CD Flip Rack

Convenient storage for 24 CD-ROMs or audio CDs. Easily flip through CDs to see title and make quick selection.

Color — Black
Size — 1"H x 16"W x 5.5"D
(2.5 x 40.6 x 14 cm)

Item	Code	Price
CD Flip Rack	AC381V	**$5.95**



Copy Holder

Reduces eye fatigue by raising copy to monitor level. Curved easel keeps paper in place and double pivot arm allows for maximum positioning.

Color — Platinum
Size — 2.8"H x 12.8"W x 1.8"D
(7.1 x 35.5 x 4.6 cm)

Item	Code	Price
Copy Holder	AC371V	**$5.95**

Adjustable Wrist Rest

Padded, free-standing wrist rest provides a range of height-positioning options for improved keying comfort.

Color — Platinum
Size — 1.8"H x 22.5"W x 3.3"D
(4.6 x 57.2 x 8.4 cm)

Item	Code	Price
Adjustable Wrist Rest	AC360V	**$20.95**

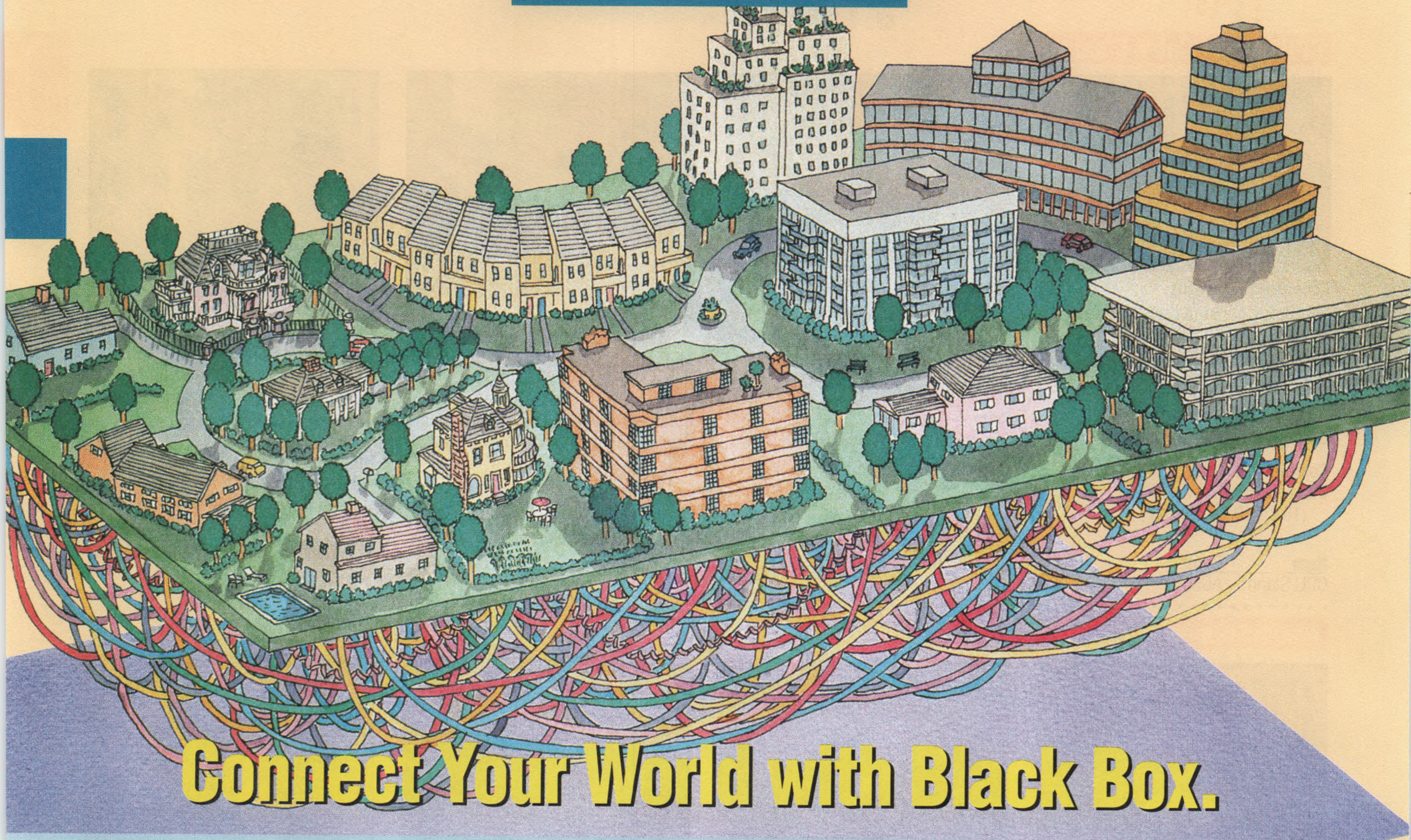
EasyVue™ Copy Holder

Lifts up to 8 inches (20.3 cm) above work surface; tilts from 20 to 35 degrees. Perfect for tight work surfaces.

Color — Platinum
Size — 20.5"H x 10.5"W x 12"D
(52.1 x 26.7 x 30.5 cm)

Item	Code	Price
EasyVue™ Copy Holder-Platinum	AC364V	**$30.95**

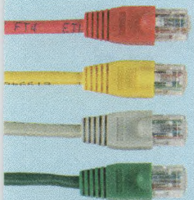
FAXBACK INFO
For All Rubbermaid Accessories
on pp. 62–63: 14663
Call 412-746-5500
Anytime



Connect Your World with Black Box.

Cable Assemblies:
Off the Rack or Tailor-Made.

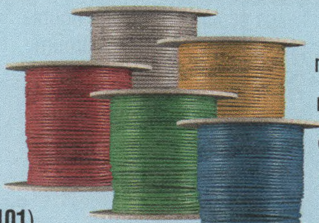
From the common to the hard-to-find, consider Black Box your source for terminated cable. If you need a telco-type cable common 20 years ago, we have it (**page 71**). Looking for Fiber or SCSI cables? Get them here (**pages 74–76, 96–101**). Considering installing a Category 5 system? Turn to **pages 68–69**. And if you can't find what you want, let us know. We'll build it for you, just like we did for Joe Rossi (**page 93**).



CAT5 Super 350 Enhanced Color Patch Cables, p. 69.

For the largest selection of cable anywhere—call Black Box. It's in stock and ready to ship. And all cables are tested before they go out the door. For extra assurance, ***all our copper cables are guaranteed for life.***

Bulk Cable:
Bulk Up *and* Trim Your Budget.



Bulk Category 5 Cable, pp. 114–115.

NEW! Find what you need faster and save money! Now, all our economy-priced bulk cables are together in one easy-to-use section. Just look for the Bulk arrow in the gray bar on the bottom of the page. No more flipping back and forth. For long-distance runs, count on Black Box bulk cable (**pages 114–123**) for strength and endurance.

Belden The Brand You Want! We now carry the most popular Belden cables—known for their quality and durability. Coax. Twinax. Category 5 UTP. Find them all starting on **page 114**.

Connectors/Adapters:
Smart Paks—Value Priced!

CONVENIENCE
SMART PAK
BUY IN BULK & SAVE!

Colored Modular Adapters, p. 129.

Complete your system and save even more with our new value-priced Smart Paks. Look for these bulk-packaged Connectors and Adapters on **pages 124, 126–128**.

Not sure what you need? Call us! Our experts make it their business to know the ins and outs of connectors, adapters, gender changers, serial, parallel, pinning, and what works with what. They'll help you get exactly what you need. Category 5. SCSI. RJ. DB. Ethernet. Coax. Fiber. All are in stock and ready to ship. Even if you need new connections for vintage equipment, we have them.

UNCONDITIONALLY GUARANTEED FOR LIFE

BLACK BOX
SOLUTIONS

7000 Connectivity Solutions

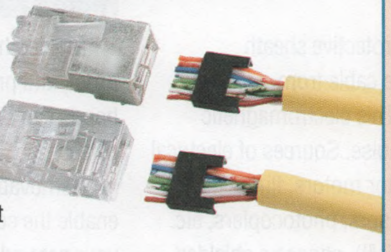
"I'm planning a mixed fiber/Category 5 UTP network for a client. But I'm tired of shopping all over town for the bits and pieces and getting bad advice from people who know less than I do. What can you do for me, Black Box?"

Start the Job with FREE Expert Advice—and an Answer in 20 Seconds. Call Black Box and you'll get FREE help in planning your system from techs who know cabling inside and out. And you won't grow old waiting for someone to answer the phone.

For even more information, order our Updated *Guide to Premise Cabling*. See **page 635** for details.

New

Check Out Our *NEW* Bulk Cable Section. We gathered all our money-saving Bulk Cables and put them in one easy-to-use section. UTP. Fiber. RS-232. Even Belden. All are in stock and ready to ship!



Finish the Job with Smart Paks. Save even more by terminating cable yourself with our Smart Paks of bulk connectors and adapters. Look for Smart Paks in our New Connectors and Adapters sections.

Buy in Bulk and Save! Check out our new do-it-yourself sections **below**. If you can't find what you need, call Tech Support at **412-746-5500**.

YES, WE HAVE BULK CABLE, CONNECTORS, AND ADAPTERS!

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PLUS! Pull-Out Bulk Cable Guide, between pp. 114–115.

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New

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Call **412-746-5500**, then...

PRESS **1,2,2** CONNECTIVITY

Printer Devices, **Cables/Connectors**, Switches, Tools/Racks, Equipment Protection/Testers

Or if You Prefer:
Fax Us at: 412-746-0746.
E-mail Us at: info@blackbox.com

What to Consider When Choosing Cable.

When buying a cable, you have to make a number of choices. You need to consider all the attributes you want in your cable: shielded or unshielded, EMI/RFI hoods versus plastic hoods, etc.

On this page, we explain all the basic choices you'll make. Of course, your application determines exactly what cable you need. But these comparisons will help guide you.

Call us at **800-552-6816** for your free Cable & Connector Guide. It lists the most common cable applications—including printer and modem cables—so you can find the cable you need quickly and easily.

Shielded vs. Unshielded

The environment usually determines whether cable should be shielded or unshielded. Quiet office environments, busy retail establishments, and industrial workshops all require different levels of shielding.

Shielding, as the name implies, is the protective sheath surrounding and protecting the wires of the cable from electromagnetic leakage and interference. This electromagnetic (EMI) activity is commonly referred to as noise. Sources of electrical interference in the workplace include elevator motors, fluorescent lights, generators, air-conditioner compressors, photocopiers, etc. To protect your data in a noisy area (high EMI), choose a shielded cable. Foil is the most basic cable shield, while a copper-braid shield provides even more protection.

Use a foil-shielded cable in busy office or retail environments. For industrial environments, you may want to choose a copper-braid shield. For quiet office environments, choose unshielded cable.

Riser (PVC) vs. Plenum

Whether you choose a riser (PVC) or plenum jacket depends on where you are going to run the cable.

Riser Cable has fire-resistant characteristics, which prevent it from spreading fire between floors, so this general-purpose cable is used in vertical shafts, typically where a cable penetrates the floor and ceiling. Riser cable usually has a polyvinyl chloride (PVC) outer jacket. It isn't for use inside plenums unless enclosed in noncombustible tubing. Communication cable for riser use is usually designated CMR (riser communications, Ref. 1987 NEC®).

Plenum Cable is used between floors in a building. It has a special coating, such as Teflon® FEP. Approved by the NEC (National Electrical Code), this cable doesn't give off toxic fumes when it burns.

EIA/TIA defines a plenum as a "space within the building created by building components, designed for the movement of environmental air, e.g. a space above a suspended ceiling or below an access floor." A false ceiling is *not* a plenum. Communication cable for use in a plenum is usually designated CMP (plenum communications, Ref. 1987 NEC).

Wire-Gauge Diameter

A smaller gauge number means larger wire, longer transmission distances, and better transmission integrity.

Metal (EMI/RFI Hoods vs. Plastic Hoods)

Molded hoods provide a termination which is essentially tamper-proof, and prevents breakage from cable flexing. Cables with molded hoods can't be repinned or routed through conduit or other tight places.

Removable hoods (in which the top of the hood can be removed) enable the connector to be repinned. You may need to repin cables if your network configuration changes, or if you run cables through conduits or other tight spaces where a molded hood just won't fit.

Molded vs. Removable Hoods

Hoods (the protective enclosure housing the connectors and covering the pinning) are either metal or plastic. Metal hoods offer protection against electromagnetic interference (EMI) and radio frequency interference (RFI) at the termination point on the connector shell. Generally, you should choose metal hoods when using shielded cable, and plastic hoods with unshielded cable.

Stranded vs. Solid Conductor

You should consider the following when deciding whether you need stranded or solid conductor cable:

Stranded Cable is for use in shorter runs between NICs (network interface cards) and wallplates, or between concentrators and patch panels, hubs, and other rackmounted equipment. Stranded-conductor cable is much more flexible than solid-core cable. However, attenuation is higher in stranded-conductor cable, so the total length of stranded cable in your system should be kept to a minimum to reduce signal degradation in your system.

Solid Cable is for use in runs between two wiring closets, or from the wiring closet to a wallplate. Solid-conductor cable shouldn't be bent, flexed, or twisted repeatedly. It's designed for both backbone and horizontal cable runs. The attenuation is lower than in stranded conductor cables.

Black Box Corporation®
The World's Source for Connectivity℠

CUSTOM SERVICES

CUSTOM CABLE FORM

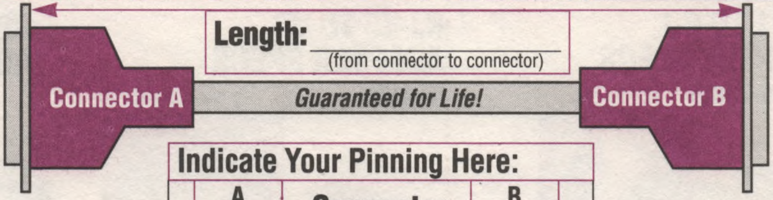
Call 412-746-5500 *24-Hour Response!*

CUSTOMIZED CABLES ARE OUR SPECIALTY. Create your own **Custom Cable** simply by indicating **C**able **T**ype, **L**ength, and **J**acket **T**ype as well as **G**ender, **C**onnector **T**ype, and **S**pecial **I**nstructions for each connector. If you selected foil-shielded **C**able **T**ype, remember to circle your **D**rain **W**ire option. Lastly, **I**ndicate **Y**our **P**inning requirements.

NEED HELP? CALL TECHNICAL SUPPORT!

Cable Type

☐ Unshielded
☐ Foil-Shielded
☐ Foil and Copper Braid Shielded
☐ Other: ____________



Length: ____________
(from connector to connector)

Cable-Length Tolerances
0–9.9 ft. ....+3"/-0"
10–99.9 ft. ....+6"/-0"
100 ft. +....................+1 ft./-0"

Jacket Type
☐ PVC ☐ Plenum

Gender: M ☐ F ☐

Connector Type: *(Circle one:)*

1. DB9
2. DB15
3. DB25
4. DB37
5. DB50
6. 15-pin high-density
7. 36-pin Centronics®
8. 50-pin telco
9. RJ-11 4-wire
10. RJ-11 6-wire
11. RJ-45 8-wire
12. DEC™ MMJ
13. RJ-45 10-wire
14. M/50
15. M/34 (V.35)
16. 50-pin Berg: RS-232 or SCSI
17. Spade lugs, length:
18. Other: ____________

Special Instructions: *(Circle options:)*

18. One end cut
19. Pins only
20. EMI/RFI (Plastic if not specified)
21. Thumbscrews
22. Screwlocks: M or F (Male if not specified)
23. 90-degree hood
—specify cable exit: ____________
24. Pairing
25. Flying leads, length: ____________
26. Label: ____________
____
27. 50-pin telco: Ears or Bail Latches
28. 36-pin Centronics: Ears or Bail Latches
29. Other—please attach specs

Drain Wire: *(Circle one:)*

(Applies only to foil-shielded cables)
30. Cut drain wire
31. Pin drain by itself ....Pin # ______
32. Wrap drain w/conductor ....Pin # ______
If 30–32 are not chosen,
33. Attach drain to shell

Quantity: ____________

OUR 24-HOUR RESPONSE!

Part Number: ____________
Contact Number: ____________
Quote Number: ____________
Order Number: ____________
Comments: ____________
____

Thank you!

Indicate Your Pinning Here:

A Pin #	Connector	B Pin #
2	Example ↔	5
	↔	
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Gender: M ☐ F ☐

Connector Type: *(Circle one:)*

1. DB9
2. DB15
3. DB25
4. DB37
5. DB50
6. 15-pin high-density
7. 36-pin Centronics
8. 50-pin telco
9. RJ-11 4-wire
10. RJ-11 6-wire
11. RJ-45 8-wire
12. DEC MMJ
13. RJ-45 10-wire
14. M/50
15. M/34 (V.35)
16. 50-pin Berg: RS-232 or SCSI
17. Spade lugs, length:
18. Other: ____________

Special Instructions: *(Circle options:)*

18. One end cut
19. Pins only
20. EMI/RFI (Plastic if not specified)
21. Thumbscrews
22. Screwlocks: M or F (Male, if not specified)
23. 90-degree hood
—specify cable exit: ____________
24. Pairing
25. Flying leads, length: ____________
26. Label: ____________
____
27. 50-pin telco: Ears or Bail Latches
28. 36-pin Centronics: Ears or Bail Latches
29. Other—please attach specs

Drain Wire: *(Circle one:)*

(Applies only to foil-shielded cables)
30. Cut drain wire
31. Pin drain by itself ....Pin # ______
32. Wrap drain w/conductor ....Pin # ______
If 30 to 32 are not chosen,
33. Attach drain to shell

Name: ____________
Title: ____________
Company: ____________
Address or P.O. Box: ____________
Mail Stop/ Suite/Building: ____________
City: ____________ State: ______ Zip: ______
☐ Home Address ☐ Business Address
Telephone: ( ) ____________
Fax: ( ) ____________

To Order:

FAX to: **800-321-0746** (24 hours, 7 days a week!)

or MAIL to:
1000 Park Drive
Lawrence, PA 15055

When Ordering...PLEASE ATTACH THIS FORM WITH OUR **ORDER FORM**.

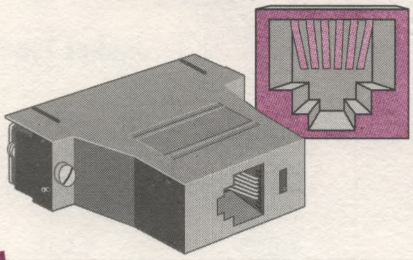
CUSTOM MODULAR ADAPTER FORM Call 412-746-5500 24-Hour Response!

Customized MODULAR ADAPTERS...THE BEST...FAST!
Create your own **Custom Modular Adapter** for RJ-11, RJ-45, or DB-to-DB-type connectors in 4 easy steps.

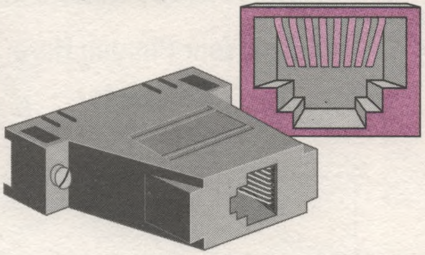
step 1

Check **RJ-11**, **RJ-45, or DB to DB A**dapter **S**pecifications.

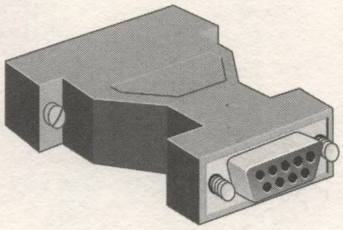
☐ **RJ-11 TO DB ADAPTER SPECS**
(4- or 6-WIRE)



☐ **RJ-45 TO DB ADAPTER SPECS**
(8-WIRE)



☐ **DB TO DB ADAPTER SPECS**



step 2

Specify **G**ender, **C**onnector **T**ype, and any **S**pecial **I**nstructions for each end of the Adapter. Note that RJ connectors are always female.

Adapter End A

Gender: **M** ☐ **F** ☐

Connector Type: *(Circle one:)*

1. DB9
2. DB15
3. DB25
4. 15-pin high-density (HD15)
5. RJ-11 (4- or 6-wire)
6. RJ-45 (8-wire)
7. DEC™ MMJ

Special Instructions: *(Circle options:)*

7. Thumbscrews
8. Screwlocks: Male or Female
9. Jumpers (see example in Step 4)
10. Other—please attach specs

Quantity:________________

Adapter End B

Gender: **M** ☐ **F** ☐

Connector Type: *(Circle one:)*

1. DB9
2. DB15
3. DB25
4. 15-pin high-density (HD15)

NOTE: Adapters not available in the following combinations: DB15/DB9, DB15/DB25, DB15/HD15, and DB15/MMJ.

Special Instructions: *(Circle options:)*

5. Thumbscrews
6. Screwlocks: Male or Female
7. Jumpers (see example in Step 4)
8. Labels (indicate location):________________
____
9. Other—please attach specs

To Order: FAX to: 800-321-0746 (24 hours, 7 days a week!) or MAIL to: 1000 Park Drive Lawrence, PA 15055

Name:____________________
Title:____________________
Company:____________________
Address or P.O. Box:____________________
Mail Stop/ Suite/Building:____________________
City: State: Zip:____________
☐ Home Address ☐ Business Address
Telephone: (   )________________
Fax: (   )________________

OUR 24-HOUR RESPONSE!

Part Number:________________
Contact Number:________________
Quote Number:________________
Order Number:________________
Comments:________________
____

Thank you!

When Ordering...PLEASE ATTACH THIS FORM WITH OUR **ORDER FORM**.

step 3

Indicate your pinning requirements below.

A Pin #	Connector Example	B Pin #
2 (RJ or DB)	↔	6 (DB only)
___	↔	___
___	↔	___
___	↔	___
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___	↔	___
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___	↔	___
___	↔	___
___	↔	___
___	↔	___
___	↔	___

step 4

Indicate jumpers on the **P**inning **D**iagram above: Use the jumper symbol] as shown below.

Pin #	Example	Pin #
2	↔	6]
3	↔	8]
4	↔	20

Unshielded Twisted-Pair (UTP) Selection Guide.

Why Use UTP?

Unshielded Twisted Pair is the most commonly used cable because of its low cost, easy installation, flexibility for moves and changes, and ability to support the full LAN bandwidth.

Although originally designed for voice, twisted pair has seen numerous advances that make it suitable for telephones, workstations, and computer systems. Category 5, the highest-grade twisted pair, can support data speeds to 100 Mbps.

One important advantage of twisted-pair cable is resistance to crosstalk. The twists prevent interference from other pairs in the cable. For this reason, UTP is recommended over nontwisted-pair, four-wire cable—"quad" wire—for multiline installations.

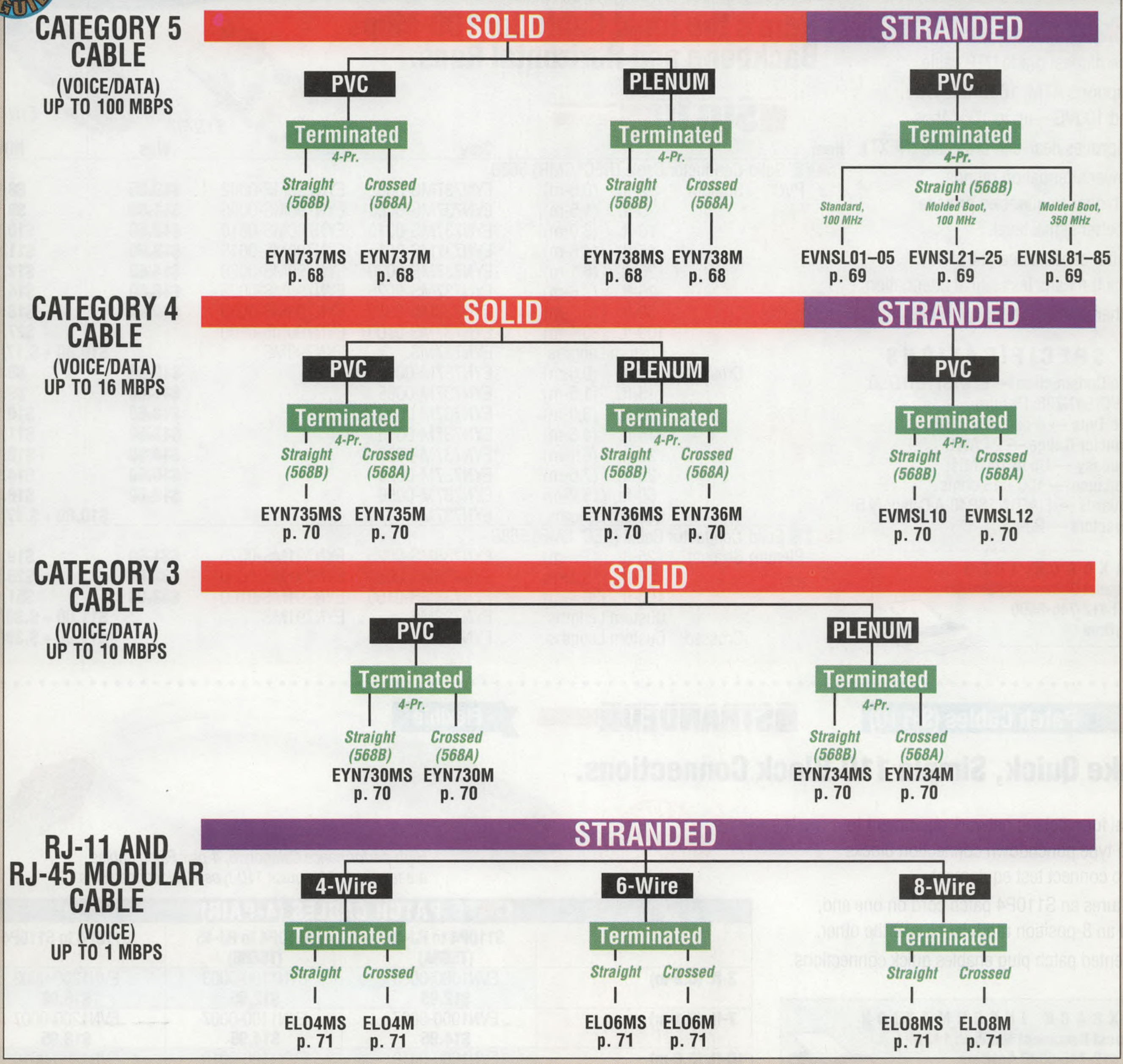
What to Consider When Choosing UTP:

1. What type of UTP cable do you need: Category 5, 4, or 3, or Modular?
2. Do you need stranded or solid cable?
3. Do you need a Riser (PVC) or Plenum jacket?
4. How many pairs do you need?
5. Will you need cable that's pre-terminated?
6. And, is your system compliant with 568B or 568A standards?

For clarification on many of these terms, see the **facing page**.

PLUS! Bulk Cable, see pp. 114–123.

TERMINATED UNSHIELDED TWISTED-PAIR (UTP) CABLES



CATEGORY 5 CABLE (VOICE/DATA) UP TO 100 MBPS
- SOLID
  - PVC — Terminated, 4-Pr.
    - Straight (568B): EYN737MS p. 68
    - Crossed (568A): EYN737M p. 68
  - PLENUM — Terminated, 4-Pr.
    - Straight (568B): EYN738MS p. 68
    - Crossed (568A): EYN738M p. 68
- STRANDED
  - PVC — Terminated, 4-Pr. — Straight (568B)
    - Standard, 100 MHz: EVNSL01–05 p. 69
    - Molded Boot, 100 MHz: EVNSL21–25 p. 69
    - Molded Boot, 350 MHz: EVNSL81–85 p. 69

CATEGORY 4 CABLE (VOICE/DATA) UP TO 16 MBPS
- SOLID
  - PVC — Terminated, 4-Pr.
    - Straight (568B): EYN735MS p. 70
    - Crossed (568A): EYN735M p. 70
  - PLENUM — Terminated, 4-Pr.
    - Straight (568B): EYN736MS p. 70
    - Crossed (568A): EYN736M p. 70
- STRANDED
  - PVC — Terminated, 4-Pr.
    - Straight (568B): EVMSL10 p. 70
    - Crossed (568A): EVMSL12 p. 70

CATEGORY 3 CABLE (VOICE/DATA) UP TO 10 MBPS
- SOLID
  - PVC — Terminated, 4-Pr.
    - Straight (568B): EYN730MS p. 70
    - Crossed (568A): EYN730M p. 70
  - PLENUM — Terminated, 4-Pr.
    - Straight (568B): EYN734MS p. 70
    - Crossed (568A): EYN734M p. 70

RJ-11 AND RJ-45 MODULAR CABLE (VOICE) UP TO 1 MBPS
- STRANDED
  - 4-Wire — Terminated
    - Straight: EL04MS p. 71
    - Crossed: EL04M p. 71
  - 6-Wire — Terminated
    - Straight: EL06MS p. 71
    - Crossed: EL06M p. 71
  - 8-Wire — Terminated
    - Straight: EL08MS p. 71
    - Crossed: EL08M p. 71

Unshielded Twisted-Pair, CAT5™ Cables—Black Box Has the Best You Can Get!

Get the Real Thing at Black Box.

Maintain the integrity of your network. Black Box cable is certified—100% guaranteed. We make sure all our Category 5 cable is tested, EIA/TIA-compliant, and ETL verified. And we'll stand behind our cable. It's guaranteed for life. You can be assured you're getting the real thing—not an inferior color-coded imitation.

Black Box Explains...

The Category 5 Cabling Standard.

The Category 5 standard establishes minimum requirements for telecommunications cabling within a commercial building, up to, and including the telecommunications outlet, and between buildings on a campus. It supports multi-product, multi-supplier environments. **It's the fastest-growing application for networking today.**

Category 5 refers to performance levels and cable characteristics for transmitting voice and data at up to 100 MBps (Megabytes per second) or more. Virtually all applications can be accommodated by Category 5 cabling systems, including voice, modems, RS-232, AppleTalk®, 3270 with baluns, ISDN, T1, 4- and 16-Mbps Token Ring, 10BASE-T, 100VG, 100BASE-T, and ATM (Asynchronous Transfer Mode).

• NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $

PLUS! CAT5 Shielded Twisted Pair, **see p. 72.**

CAT5 Solid Conductor Cables

Here's the Ideal Cable for 100-Mbps Backbone and Horizontal Runs.

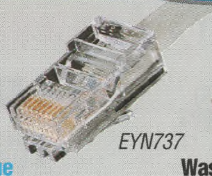
- The highest grade UTP cable.
- Supports ATM, 100BASE-TX, and 100VG—up to 100 Mbps.
- Improves near-end crosstalk (NEXT).
- Lower attenuation ratings at higher frequencies provide a better signal level.
- Better capacitance (14 pF/ft.), which means less signal attenuation.
- Other configurations available.

SPECIFICATIONS

Cable Construction — EYN737, EYN790: PVC; EYN738: Plenum
Cable Type — 4-pair solid UTP
Conductor Gauge — 24 AWG
Frequency — Up to 100 MHz
Impedance — 100 ± 15 ohms
Standards — EIA/TIA TSB40-A Category 5
Connectors — RJ-45

FAXBACK INFO
Request Document Number: 12609
Call 412-746-5500
Anytime

SOLID


EYN737

EYN790

Item			Gray	Blue	Was	NOW!
CAT5 Solid-Conductor Cable (NEC® CMR) 568B						
PVC	Straight	2-ft. (0.6-m)	EYN737MS-0002	EYN790MS-0002	~~$10.95~~	$8.95
		5-ft. (1.5-m)	EYN737MS-0005	EYN790MS-0005	~~$11.50~~	$9.95
		10-ft. (3.0-m)	EYN737MS-0010	EYN790MS-0010	~~$12.50~~	$10.95
		15-ft. (4.6-m)	EYN737MS-0015	EYN790MS-0015	~~$13.50~~	$11.95
		20-ft. (6.1-m)	EYN737MS-0020	EYN790MS-0020	~~$14.50~~	$12.95
		25-ft. (7.6-m)	EYN737MS-0025	EYN790MS-0025	~~$15.50~~	$14.95
		50-ft. (15.2-m)	EYN737MS-0050	EYN790MS-0050	~~$19.50~~	$18.95
		100-ft. (30.4-m)	EYN737MS-0100	EYN790MS-0100		$27.95
		Custom Lengths	EYN737MS	EYN790MS		$10.80 + $.17/ft.
	Crossed	2-ft. (0.6-m)	EYN737M-0002		~~$10.95~~	$8.95
		5-ft. (1.5-m)	EYN737M-0005		~~$11.50~~	$9.95
		10-ft. (3.0-m)	EYN737M-0010		~~$12.50~~	$10.95
		15-ft. (4.6-m)	EYN737M-0015		~~$13.50~~	$11.95
		20-ft. (6.1-m)	EYN737M-0020		~~$14.50~~	$12.95
		25-ft. (7.6-m)	EYN737M-0025		~~$15.50~~	$14.95
		50-ft. (15.2-m)	EYN737M-0050		~~$19.50~~	$18.95
		Custom Lengths	EYN737M			$10.80 + $.17/ft.
CAT5 Solid-Conductor Cable (NEC® CMP) 568B						
Plenum	Straight	25-ft. (7.6-m)	EYN738MS-0025	EYN791MS-0025	~~$21.50~~	$19.95
		50-ft. (15.2-m)	EYN738MS-0050	EYN791MS-0050	~~$32.00~~	$29.95
		100-ft. (30.4-m)	EYN738MS-0100	EYN791MS-0100	~~$53.00~~	$51.95
		Custom Lengths	EYN738MS	EYN791MS		$11.00 + $.39/ft.
	Crossed	Custom Lengths	EYN738M			$11.00 + $.39/ft.

CAT5 Patch Cables (S-110)

STRANDED

Flexible

Make Quick, Simple 110-Block Connections.

- Ideal for patching network equipment to 110-type punchdown connection blocks or to connect test equipment.
- Features an S110P4 patch cord on one end, and an 8-position modular plug at the other.
- Patented patch plug enables quick connections.

FAXBACK INFORMATION
Request Document Number: 14371
Call 412-746-5500 Anytime

High-performance Category 5, 4-pair Patch Cables are terminated for quick 110-type block connections.

CAT5 PATCH CABLES (4-PAIR)

	S110P4 to RJ-45 (T568A)	S110P4 to RJ-45 (T568B)	S110P4 to S110P4
3-ft. (0.9-m)	EVN1000-0003 $12.95	EVN1100-0003 $12.95	EVN1200-0003 $16.95
7-ft. (2.1-m)	EVN1000-0007 $14.95	EVN1100-0007 $14.95	EVN1200-0007 $18.95
10-ft. (3.0-m)	EVN1000-0010 $16.95	EVN1100-0010 $16.95	EVN1200-0010 $19.95

CAT5 Color Patch Cables (RJ-45) **STRANDED** **Flexible**

CAT5™ UTP Cables for 100–350 MHz-Applications. Color-Coded, Too, for Easy Installation When Patching.

ABSOLUTELY GUARANTEED FOR LIFE

EVMSL05

EVNSL25

BEST
350 MHz
New

EVNSL81

CAT5 Color Patch Cables—

- Certified to 100 MHz.
- TSB 568B wiring.
- 10 standard lengths in stock and ready to ship.

PLUS! Colored CAT5™ Bulk Cable, **see p. 115.**

CAT5 Color Patch Cables with Molded Boots—

- Certified to 100 MHz.
- Molded boots prevent cable kinks and bent pins when removing from patch panels. And they reduce crosstalk.
- TSB 568B wiring.

CAT5 Super 350 Enhanced Color Patch Cables—

- Provide 350-MHz performance, more than *triple* the frequency range of the Category 5 standard.
- Molded, snag-free boots prevent cable kinks and bent pins when removing from patch panels. And they reduce crosstalk.
- TSB 568B wiring.
- **Belden** DataTwist 350 UTP Cable.

FAXBACK INFORMATION
For Enhanced Patch Cables: 19156
For Patch Cables with Molded Boots: 15468
For Color Patch Cables: 13466
Call 412-746-5500 Anytime

SPECIFICATIONS

Cable Construction — PVC
Cable Type — 4-pair stranded UTP
Conductor Gauge — 24 AWG
Frequency — EVNSL81–EVNSL85: Up to 350 MHz; EVNSL21–EVNSL25: Up to 100 MHz; EVNSL01–EVNSL05: Up to 100 MHz
Impedance — EVNSL81–EVNSL85: 100 ± 22 ohms; EVNSL21–EVNSL25: 100 ± 15 ohms; EVNSL01–EVNSL05: 100 ± 15 ohms
Mutual Capacitance — EVNSL81–EVNSL85: 14 pF/ft.; EVNSL21–EVNSL25: 15 pF/ft.; EVNSL01–EVNSL05: 15 pF/ft.
Standards — EIA/TIA TSB 40-A Category 5
Wiring Type — 568B
Connectors — RJ-45

Item		**Blue**	**Green**	**Red**	**Yellow**	**Beige**	**Price**
CAT5 Super 350 Enhanced Color Patch Cables (RJ-45 to RJ-45), 4-Pair							New
1-ft.	(0.3-m)	EVNSL81-0001	EVNSL82-0001	EVNSL83-0001	EVNSL84-0001	EVNSL85-0001	**$8.95**
3-ft.	(0.9-m)	EVNSL81-0003	EVNSL82-0003	EVNSL83-0003	EVNSL84-0003	EVNSL85-0003	**$10.95**
6-ft.	(1.8-m)	EVNSL81-0006	EVNSL82-0006	EVNSL83-0006	EVNSL84-0006	EVNSL85-0006	**$12.95**
10-ft.	(3.0-m)	EVNSL81-0010	EVNSL82-0010	EVNSL83-0010	EVNSL84-0010	EVNSL85-0010	**$14.95**
20-ft.	(6.1-m)	EVNSL81-0020	EVNSL82-0020	EVNSL83-0020	EVNSL84-0020	EVNSL85-0020	**$19.95**
Custom Lengths		EVNSL81	EVNSL82	EVNSL83	EVNSL84	EVNSL85	**$8.95 + $.65/ft.**
CAT5 Color Patch Cables with Molded Boots (RJ-45 to RJ-45), 4-Pair							
3-ft.	(0.9-m)	EVNSL21-0003	EVNSL22-0003	EVNSL23-0003	EVNSL24-0003	EVNSL25-0003	**$7.95**
6-ft.	(1.8-m)	EVNSL21-0006	EVNSL22-0006	EVNSL23-0006	EVNSL24-0006	EVNSL25-0006	**$9.95**
10-ft.	(3.0-m)	EVNSL21-0010	EVNSL22-0010	EVNSL23-0010	EVNSL24-0010	EVNSL25-0010	**$11.95**
20-ft.	(6.1-m)	EVNSL21-0020	EVNSL22-0020	EVNSL23-0020	EVNSL24-0020	EVNSL25-0020	**$15.95**
CAT5 Color Patch Cables (RJ-45 to RJ-45), 4-Pair							
1-ft.	(0.3-m)	EVNSL01-0001	EVNSL02-0001	EVNSL03-0001	EVNSL04-0001	EVNSL05-0001	**$4.95**
3-ft.	(0.9-m)	EVNSL01-0003	EVNSL02-0003	EVNSL03-0003	EVNSL04-0003	EVNSL05-0003	**$6.95**
6-ft.	(1.8-m)	EVNSL01-0006	EVNSL02-0006	EVNSL03-0006	EVNSL04-0006	EVNSL05-0006	**$8.95**
10-ft.	(3.0-m)	EVNSL01-0010	EVNSL02-0010	EVNSL03-0010	EVNSL04-0010	EVNSL05-0010	**$10.95**
15-ft.	(4.5-m)	EVNSL01-0015	EVNSL02-0015	EVNSL03-0015	EVNSL04-0015	EVNSL05-0015	**$11.95**
20-ft.	(6.1-m)	EVNSL01-0020	EVNSL02-0020	EVNSL03-0020	EVNSL04-0020	EVNSL05-0020	**$14.95**
25-ft.	(7.6-m)	EVNSL01-0025	EVNSL02-0025	EVNSL03-0025	EVNSL04-0025	EVNSL05-0025	**$16.95**
30-ft.	(9.1-m)	EVNSL01-0030	EVNSL02-0030	EVNSL03-0030	EVNSL04-0030	EVNSL05-0030	**$19.95**
50-ft.	(15.2-m)	EVNSL01-0050	EVNSL02-0050	EVNSL03-0050	EVNSL04-0050	EVNSL05-0050	**$22.95**
100-ft.	(30.4-m)	EVNSL01-0100	EVNSL02-0100	EVNSL03-0100	EVNSL04-0100	EVNSL05-0100	**$36.95**
Custom Lengths		EVNSL01	EVNSL02	EVNSL03	EVNSL04	EVNSL05	**$8.95 + $.40/ft.**

* * *

CAT5 Coupler — Join Category 5 Patch Cords and Maintain Category 5 Performance.

- Couple two or more Category 5 patch cables—and still transmit at 100 Mbps.
- Great for temporary links.
- Make absolutely secure connections.
- Easy installation. Just feed cable through, then lock in place.
- Works with either T568A or T568B wiring.

SPECIFICATIONS

Modular Jack — RJ-45 with captive pin
Size — 1.2"H x 0.7"W x 1.9"D (3 x 1.8 x 4.6 cm)

Item	**Code**	**Price**
CAT5 Coupler	FM500	**$12.95**

Black Box Explains...

Category 3 and 4.

Category 3 is the performance level for voice and data transmission up to 16 MHz or 10 Mbps, such as 4-Mbps Token Ring and 10BASE-T.

Category 4 is the performance level for voice and data transmission up to 20 MHz or 16 Mbps, such as 4-/16-Mbps UTP.

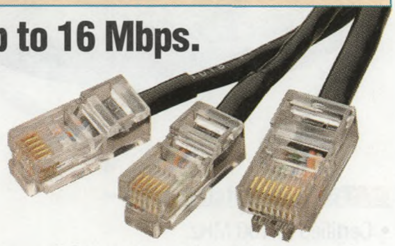
Both offer solid performance, *and* Black Box guarantees their reliability. If you think you may be upgrading your network within the next few years, consider Category 5 cable. It offers more speed and versatility than Category 3 or 4 at a minimal cost difference. For more information on Category 5 cable, see **p. 68**.

Category 4 Cable (Stranded & Solid)

Category 4 Cable—for Networks up to 16 Mbps.

- Ideal for 16-Mbps Token Ring. Stranded patch cable is typically used for short runs where the cable will be moved or flexed regularly.
- Use stranded cable for connecting workstation NICs (Network Interface Cards) to the wallplate, and with patch panels.
- Ideal for Token Ring backbone cabling, solid-core cable is typically used for stable, long-distance cable runs.

Patch
STRANDED
SOLID
Backbone


Category 4 UTP cable showing RJ-11 connectors (left and center) and an RJ-45 connector (right).

Item	Code	Price
Category 4 Cable, Straight-Pinned, Stranded Conductor (568B)		
PVC 4-Pair		
3-ft. (0.9-m)	EVMSL10-0003	**$5.45**
6-ft. (1.8-m)	EVMSL10-0006	**$7.45**
10-ft. (3.0-m)	EVMSL10-0010	**$10.45**
20-ft. (6.1-m)	EVMSL10-0020	**$11.45**
Custom Lengths	EVMSL10	**$6.45 + $.39/ft.**
Category 4 Cable, Cross-Pinned, Stranded Conductor		
PVC 4-Pair		
6-ft. (1.8-m)	EVMSL12-0006	**$7.45**
10-ft. (3.0-m)	EVMSL12-0010	**$10.45**
Category 4 Cable, Straight-Pinned, Solid Conductor		
PVC 2-Pair (USOC)		
2-ft. (0.6-m)	EYN715MS-0002	**$7.50**
5-ft. (1.5-m)	EYN715MS-0005	**$8.00**
10-ft. (3.0-m)	EYN715MS-0010	**$8.50**
15-ft. (4.6-m)	EYN715MS-0015	**$9.00**
20-ft. (6.1-m)	EYN715MS-0020	**$9.50**
25-ft. (7.6-m)	EYN715MS-0025	**$10.50**
50-ft. (15.2-m)	EYN715MS-0050	**$12.50**
Custom Lengths	EYN715MS	**$7.20 + $.12/ft.**
Plenum Custom Lengths	EYN716MS	**$7.30 + $.21/ft.**

Item	Code	Price
Category 4 Cable, Straight-Pinned, Solid Conductor (continued)		
PVC 3-Pair (USOC)		
2-ft. (0.6-m)	EYN725MS-0002	**$7.50**
5-ft. (1.5-m)	EYN725MS-0005	**$8.00**
10-ft. (3.0-m)	EYN725MS-0010	**$8.50**
15-ft. (4.6-m)	EYN725MS-0015	**$9.50**
20-ft. (6.1-m)	EYN725MS-0020	**$10.50**
25-ft. (7.6-m)	EYN725MS-0025	**$11.00**
50-ft. (15.2-m)	EYN725MS-0050	**$14.50**
Custom Lengths	EYN725MS	**$7.40 + $.16/ft.**
Plenum Custom Lengths	EYN726MS	**$7.50 + $.26/ft.**
Category 4 Cable, Straight-Pinned, Solid Conductor		
PVC 4-Pair (TIA 568B)		
2-ft. (0.6-m)	EYN735MS-0002	**$8.50**
5-ft. (1.5-m)	EYN735MS-0005	**$9.00**
10-ft. (3.0-m)	EYN735MS-0010	**$9.50**
15-ft. (4.6-m)	EYN735MS-0015	**$10.00**
20-ft. (6.1-m)	EYN735MS-0020	**$11.00**
25-ft. (7.6-m)	EYN735MS-0025	**$11.50**
50-ft. (15.2-m)	EYN735MS-0050	**$14.50**
Custom Lengths	EYN735MS	**$8.10 + $.13/ft.**
Plenum Custom Lengths	EYN736MS	**$8.30 + $.35/ft.**

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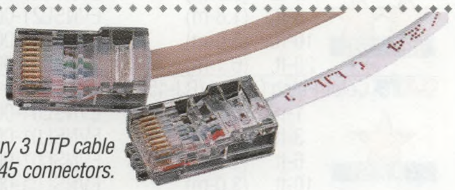
Category 3 Solid Conductor Cable

Category 3 Cable—for Networks up to 10 Mbps.

- These 4-pair telco-type cables run at speeds up to 10 Mbps.
- Cost-effective means of wiring your horizontal system.


Category 3 UTP cable with RJ-45 connectors.

Item	Code	Price
Category 3 Cable-Solid Conductor (4-Pair)		
PVC Straight (568B) Pinning	EYN730MS-MM	**$6.95 + $.11/ft.**
Cross-Pinned	EYN730M-MM	**$6.95 + $.11/ft.**
with Spade Lugs, Both Ends	EYN730S	**$9.95 + $.11/ft.**

Item	Code	Price
Category 3 Cable-Solid Conductor (4-Pair)		
Plenum Straight (568B) Pinning	EYN734MS-MM	**$6.95 + $.21/ft.**
Cross-Pinned	EYN734M-MM	**$6.95 + $.21/ft.**
with Spade Lugs, Both Ends	EYN734S	**$9.95 + $.21/ft.**

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DEC 423 MMJ Cable • MMJ Connector

The Low-Cost Equivalent of DEC MMJ Components.

- The MMJ Cable and Connector work with any DEC™ compatible components—MMJ wallplates and adapters. They also work with the MMJ Switch (see **page 244**).

For Crimp Tools, **see p. 158.**

EVAAD

Item	Code	Price
DEC 423 MMJ Cable *(DEC Part #BC16E)*		
10-ft (3.0-m)	EVAAD-0010	**$5.95**
25-ft. (7.6-m)	EVAAD-0025	**$8.95**
50-ft. (15.2-m)	EVAAD-0050	**$12.95**
Custom Lengths	EVAAD	**$5.95 + $.16/ft.**

Item	Code	Price
MMJ Straight-Pinned Cable		
10-ft. (3.0-m)	EHM007-0010	**$3.95**
25-ft. (7.6-m)	EHM007-0025	**$8.95**
MMJ Connector	FM100	**$.89**

In This Section...
UTP
STP
Fiberoptic
Coax, Twinax, & Ethernet
Token Ring
RS-232

RJ-11 and RJ-45 Modular Cable

STRANDED

Flat Satin Cabling for Voice and Data.

- All-purpose cables are for voice and data applications running up to 1 Mbps.
- Not recommended for Token Ring or Ethernet applications.

NOTE: Specify straight-through or cross-pinning when ordering.

SPECIFICATIONS

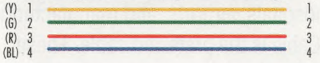
Cable Construction — Gray flat satin, PVC
Conductor Gauge — 28 AWG
Maximum Distance — As per equipment specifications
Mutual Capacitance — 22 pF/ft.
Resistance — 45 ohms/1000 ft.
Connectors — EL04MS, M: 4-wire; EL06MS, M: 6-wire; EL08MS, M: 8-wire

ABSOLUTELY GUARANTEED FOR LIFE

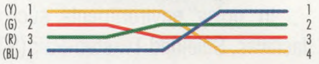
Item	Straight-Pinning	Cross-Pinning	Price
RJ-11 (4-Wire) Modular Cable			
4-ft. (1.2-m)	EL04MS-04	EL04M-04	$1.95
7-ft. (2.1-m)	EL04MS-07	EL04M-07	$2.95
14-ft. (4.3-m)	EL04MS-14	EL04M-14	$3.95
25-ft. (7.6-m)	EL04MS-25	EL04M-25	$4.95
Custom Lengths	EL04MS-MM	EL04M-MM	$4.90 + $.11/ft.
RJ-11 (6-Wire) Modular Cable			
4-ft. (1.2-m)	EL06MS-04	EL06M-04	$2.95
7-ft. (2.1-m)	EL06MS-07	EL06M-07	$3.95
14-ft. (4.3-m)	EL06MS-14	EL06M-14	$5.95
25-ft. (7.6-m)	EL06MS-25	EL06M-25	$6.95
Custom Lengths	EL06MS-MM	EL06M-MM	$4.90 + $.16/ft.
RJ-45 (8-Wire) Modular Cable			
4-ft. (1.2-m)	EL08MS-04	EL08M-04	$3.95
7-ft. (2.1-m)	EL08MS-07	EL08M-07	$4.95
14-ft. (4.3-m)	EL08MS-14	EL08M-14	$6.95
25-ft. (7.6-m)	EL08MS-25	EL08M-25	$9.95
Custom Lengths	EL08MS-MM	EL08M-MM	$4.95 + $.22/ft.

EL04MS

RJ-11 (4-Wire) Straight-Through Pinning



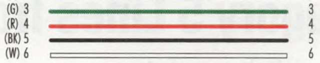
RJ-11 (4-Wire) Cross-Pinning



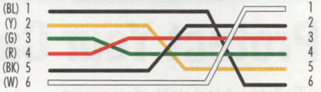
NOTE: The Extension Cable (EL04M, Cross-Pinning) is for typical telephone use.

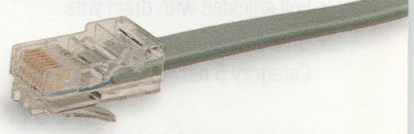
EL06MS

RJ-11 (6-Wire) Straight-Through Pinning



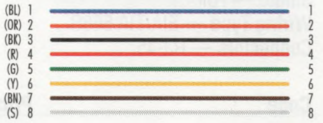
RJ-11 (6-Wire) Cross-Pinning



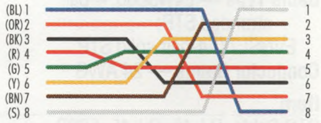


EL08MS

RJ-45 (8-Wire) Straight-Through Pinning



RJ-45 (8-Wire) Cross-Pinning



PLUS! Bulk Cable, see pp. 114–123.

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Modular Coiled Handset Cords

- Replace worn-out telephone cords.
- Fully shielded with braided copper.
- All contacts are gold-plated.

Item		Code	Price
Modular Coiled Handset Cords			
Black	12-ft. (3.6-m)	EJ300-0012	$4.95
	25-ft. (7.6-m)	EJ300-0025	$6.95
Ivory	12-ft. (3.6-m)	EJ301-0012	$4.95
	25-ft. (7.6-m)	EJ301-0025	$6.95

Untangler

- Keeps telephone cords untangled.

FAXBACK INFO
Request Document Number: 14890
Call 412-746-5500
Anytime

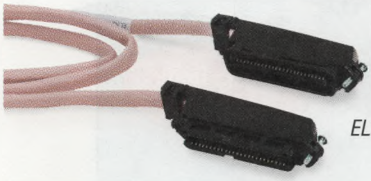
Item	Code	Price
Untangler	FA862	$6.95

◆ ◆ ◆

Telco-Type Connector Cable (PVC NEC® CMR; Plenum NEC® CMP)

For Your UTP Applications— Get 25 Pairs over Just One Cable.

ABSOLUTELY GUARANTEED FOR LIFE



ELN25T

SPECIFICATIONS

Conductor Gauge — 24 AWG
Distance — As equipment specifies
Hood — 90° black plastic
Shield — Unshielded
Connectors — 50-pin telco-type

Item	Code	Code	Price
25-Pair (One Connector and One End Open)			
	Female Connector	*Male Connector*	
PVC 25-ft. (7.6-m)	ELN25T-0025-F	ELN25T-0025-M	$22.95
50-ft. (15.2-m)	ELN25T-0050-F	ELN25T-0050-M	$32.95
100-ft. (30.5-m)	ELN25T-0100-F	ELN25T-0100-M	$52.95
200-ft. (61.0-m)	ELN25T-0200-F	ELN25T-0200-M	$95.95
Custom Lengths	ELN25T-F	ELN25T-M	$12.50 + $.44/ft.
Plenum	ELN25TP-F	ELN25TP-M	$13.20 + $1.10/ft.

SOLID

Item	Code	Code	Code	Price
25-Pair (Two Connectors—One at Each End)				
	Female/Female	*Male/Female*	*Male/Male*	
PVC 5-ft. (1.5-m)	ELN25T-0005-FF	ELN25T-0005-MF	ELN25T-0005-MM	$19.95
25-ft. (7.6-m)	ELN25T-0025-FF	ELN25T-0025-MF	ELN25T-0025-MM	$28.95
50-ft. (15.2-m)	ELN25T-0050-FF	ELN25T-0050-MF	ELN25T-0050-MM	$38.95
100-ft. (30.5-m)	ELN25T-0100-FF	ELN25T-0100-MF	ELN25T-0100-MM	$59.95
200-ft. (61.0-m)	ELN25T-0200-FF	ELN25T-0200-MF	ELN25T-0200-MM	$99.95
Custom Lengths	ELN25T-FF	ELN25T-MF	ELN25T-MM	$18.10 + $.44/ft.
Plenum	ELN25TP-FF	ELN25TP-MF	ELN25TP-MM	$18.80 + $1.10/ft.
50-Pair (Two Connectors and One End Open)				
	2 Female Connectors		*2 Male Connectors*	
PVC 25-ft. (7.6-m)	EMN50T-0025-F		EMN50T-0025-M	$68.00
50-ft. (15.2-m)	EMN50T-0050-F		EMN50T-0050-M	$105.00
100-ft. (30.5-m)	EMN50T-0100-F		EMN50T-0100-M	$175.00
200-ft. (61.0-m)	EMN50T-0200-F		EMN50T-0200-M	$320.00
50-Pair (Four Connectors—Two at Each End)				
	Female/Female	*Male/Female*	*Male/Male*	
PVC 25-ft. (7.6-m)	EMN50T-0025-FF	EMN50T-0025-MF	EMN50T-0025-MM	$82.00
50-ft. (15.2-m)	EMN50T-0050-FF	EMN50T-0050-MF	EMN50T-0050-MM	$119.00
100-ft. (30.5-m)	EMN50T-0100-FF	EMN50T-0100-MF	EMN50T-0100-MM	$192.00
200-ft. (61.0-m)	EMN50T-0200-FF	EMN50T-0200-MF	EMN50T-0200-MM	$337.00
Custom Lengths		EMN50T-MF	EMN50T-MM	$45.95 + $1.65/ft.

Black Box Explains...

Unshielded vs. Shielded Twisted-Pair Cabling.

In "noisy" environments, such as hospitals, airports, and manufacturing facilities, Shielded Twisted-Pair (STP) Cable is the preferred cable. These environments contain radio-frequency interference (RFI) and/or electromagnetic interference (EMI). The shielding in STP protects the data being transmitted through the cable, and it keeps the cable itself from emitting EMI and RFI. Because of its noise and EMI/RFI interference protection, shielded cable does cost slightly more than unshielded cable.

BLACK BOX® STP cables feature the same core and jacket as our UTP cables. And they contain a drain wire and a foil shield that covers all four pairs. The plugs on STP cable are also shielded. Although STP cable has yet to be fully covered by an EIA/TIA standard, a footnote does state that 100-ohm cables may be used if they meet UTP transmission standards. BLACK BOX® STP cable meets or exceeds UTP transmission standards—*Guaranteed!*

Shielded Twisted-Pair Cable (STP)

Protect Your Category 5 Lines from Noise.

CAT5™

- Foil shielded with drain wire.
- Shield noise from your Category 5 network.
- Meets or exceeds Category 5 standards.
- Custom lengths available.

SPECIFICATIONS

Cable Construction — EVNSL60: PVC; EVNSL71: Plenum

Cable Type — EVNSL60: 4-pair stranded STP; EVNSL71: 4-pair solid STP

Conductor Gauge — 24 AWG

Frequency — Up to 100 MHz

Impedance — 100 ± 15 Ohms

Shield — Foil

Wiring Type — EIA/TIA 568B

Connectors — RJ-45

Item	Code	Price
STP Cable, RJ-45–RJ-45, 568B		
Stranded, PVC, CMR Riser		
3-ft. (0.9-m)	EVNSL60-0003	**$11.95**
6-ft. (1.8-m)	EVNSL60-0006	**$13.95**
10-ft. (3.0-m)	EVNSL60-0010	**$16.95**
20-ft. (6.1-m)	EVNSL60-0020	**$19.95**
Custom Lengths	EVNSL60	**$13.95 + $.46/ft.**
Solid, Plenum NEC® CMP, Plenum Rated		
2-ft. (0.6-m)	EVNSL71-0002	**$19.95**
5-ft. (1.5-m)	EVNSL71-0005	**$22.95**
10-ft. (3.0-m)	EVNSL71-0010	**$29.95**
15-ft. (4.6-m)	EVNSL71-0015	**$36.95**
20-ft. (6.1-m)	EVNSL71-0020	**$42.95**
25-ft. (7.6-m)	EVNSL71-0025	**$49.95**
50-ft. (15.2-m)	EVNSL71-0050	**$86.95**
100-ft. (30.4-m)	EVNSL71-0100	**$149.95**

STRANDED

EVNSL60

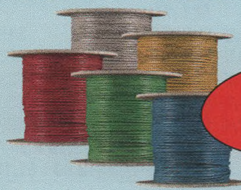
SOLID

EVNSL71

Call for Large-Quantity Pricing!

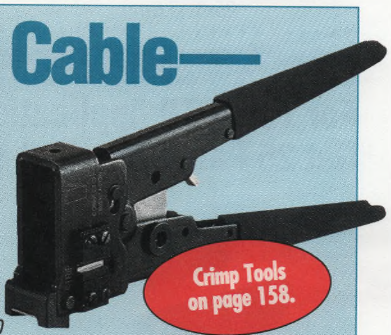
FAXBACK INFO
Request Document Number: 18045
Call 412-746-5500
Anytime

Build Your Own CAT5™ Twisted-Pair Cable—Black Box Has All the Pieces!


Bulk Cable on page 115.

FM731

Connectors on page 124.


FTM40

Crimp Tools on page 158.

Build Shielded Twisted-Pair Cable.

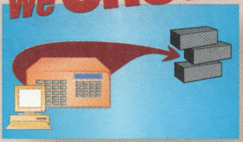
1. Start with the Bulk Shielded Twisted-Pair Cable (EVMSL06A) listed on **p. 115**.
2. Choose Shielded High-Performance Modular Plugs (FM731) on **p. 124**.
3. Finish the job with the Modular Crimp Tool (FTM40) and Category 5 Die Set (FTM50), **p. 158**.
4. To test the cable, try our Scanners on **pp. 196–202**, or our Modular Testers, **p. 203**.

Build Unshielded Twisted-Pair Cable.

1. Start with the Bulk Unshielded Cables listed on **pp. 114–115** (EYN717A–EYN718A, EYN737A, EYN738A, or EVNSL05A).
2. Choose Unshielded High-Performance Modular Plugs (FM732) on **p. 124**.
3. Finish the job with the Modular Crimp Tool (FTM40) and Category 5 Die Set (FTM50), **p. 158**.
4. To test the cable, try our Scanners on **pp. 196–202**, or our Modular Testers, **p. 203**.

The Black Box Experts Talk about... BLACK BOX® ServSwitch™ technology

We Showed You...



How to Save Space. How to Save Time. How to Save Money.

- Why set up, configure, maintain, and *pay for* multiple server workstations when you can control them all from a single keyboard/video/mouse (KVM) workstation?

The solution—a BLACK BOX® ServSwitch™.

- Thanks to the advanced Keyboard/Mouse Reset function featured on most ServSwitches, MIS personnel can sleep peacefully knowing they won't be called out in the middle of the night to reboot a computer with a "frozen" keyboard. ServSwitches, specially engineered to support KVM emulation and prevent lockups or other errors that may occur during switching, give you unparalleled flexibility to consolidate and manage multiple servers.
- About one-fourth the size of a 17-inch monitor, each compact ServSwitch is built to give you maximum performance in the smallest package. What's more, with a ServRack, you can consolidate operations even more by installing *all* your server management hardware in one durable, heavy-duty, *movable* rack!
- No more leaving your desk to access each server. Depending on which ServSwitch model you choose, one unit can support from four to more than 3000 CPUs.

BLACK BOX (412) 746-5500
ServSwitch Basic
READY
CPU SELECT
POWER
CPU 1
CPU 2
CPU 3
CPU 4

The simple saving solution—ServSwitch Basic. Manage two or four CPUs from a single KVM station. Turn to ***page 276*** *to get all the details.*

You Asked for More...

Black Box Delivered with ServSwitch Support for Multiple Platforms, Multiple Inputs, and Remote Access.

- Start with the ServManager—our first ServSwitch to incorporate flash ROM, it's designed to handle upgrades in an instant. Just download the file from the BLACK BOX® Bulletin Board Service and copy it into the ServManager. We include all the cables you'll need—there's no special software required—and the updates are *free!* In the fast-paced world of computer management, this is one feature that's *highly* regarded by shrewd system managers.
- Next, there's our Matrix ServSwitch, designed with two input ports to connect multiple management workstations. Use one to slash your configuration/maintenance time in half. We also added the ServMaster, which enables you to network up to 256 machines so you can access a remote computer from any other computer on the bus.
- Finally...We brought you ServSwitches with the RS-232 ports you asked for (for switching control), distance extenders (to support connections up to 700 feet), and the ability to manage remote applications using pcANYWHERE® and remote CPU Access.

BLACK BOX (412) 746-5500
ServManager

Multiplatform ServManager supports PC, Sun and Mac computers. You can read all about it on ***page 278.***

And for the Future...

Turn to Black Box for Innovative New ServSwitch Solutions as Your Network Grows.

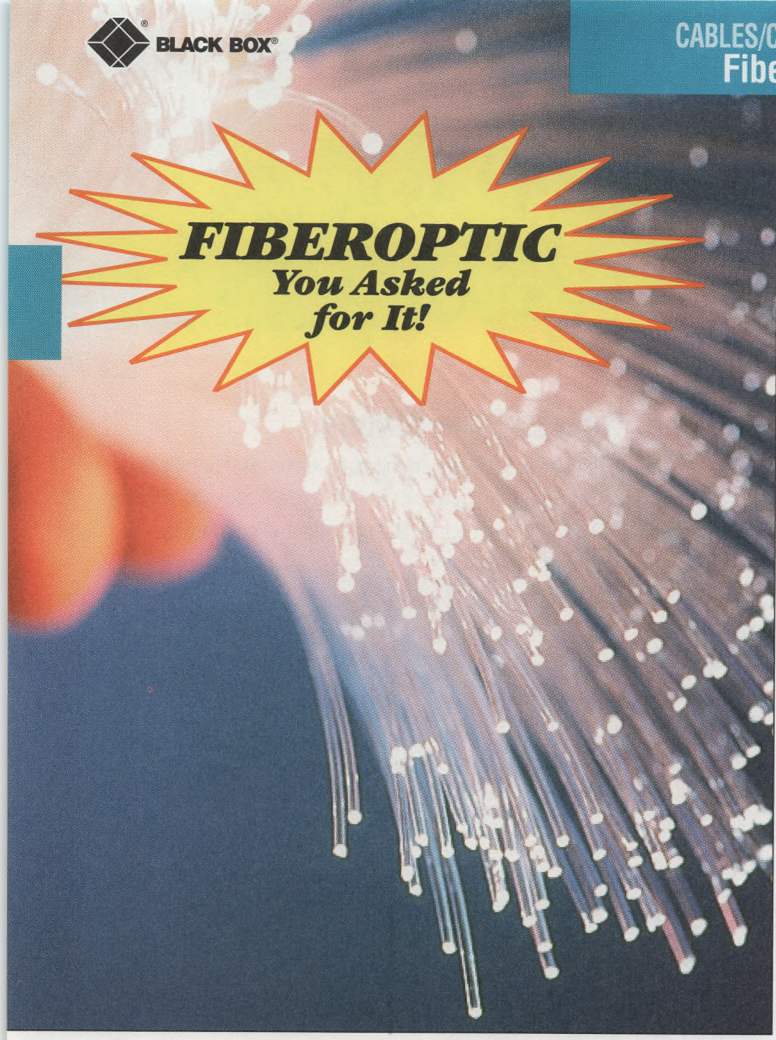
- Look for upcoming ServSwitches to support a wider range of computers, including SGI Onyx, RS6000, HP9000, and more! You can use these new super switches to control virtually anything that uses a keyboard, monitor, and a mouse.
- Still need more inputs? Soon, you'll have the option of adding up to 16 sets of KVM control stations to manage multiple CPUs on a truly grand scale.
- Tons of New Features—Including reduced power-consumption boards, on-screen display menus for advanced configurations, full audio support for CDs and sound cards—even serial ports so you can add a scanner or printer as well!

EXPERT TECHNICAL SUPPORT
24 HOURS A DAY
7 DAYS A WEEK
412-746-5500

Have more questions? Call the Black Box Experts—412-746-5500—24 hours a day, 7 days a week.

For informative monthly discussions on the latest technology trends, subscribe to *Connectivity NEWS*℠. Written by the technical experts at Black Box, *Connectivity NEWS*℠ provides expert answers on tomorrow's solutions—TODAY!

Connectivity NEWS
Category 5 System Certification



Fiberoptic Cable

Superior Fiberoptic Cable—Popular Lengths at Great Prices!

- **Near-unlimited bandwidth at high speeds over long distances.**
- **ST® to SC and SC to SC configurations available.**
- **Totally immune to electrical interference.**

Call Black Box For Same-Day Shipping

IN STOCK & READY TO SHIP!

With these low prices, *now* is the best time to install fiberoptic cable. Get almost unlimited bandwidth at high speeds—*and* over long distances. Run fiber to the desktop for increasingly common high-data-rate systems such as FDDI, multimedia, or ATM (Asynchronous Transfer Mode)—any application that requires the transfer of large, network-time-consuming files.

SPECIFICATIONS

Cable Size — 0.12" x 0.24" (3 x 6.1 mm)
Cladding Diameter — 125 µm
Core Diameter — 62.5 µm
Fiber Type — Multimode (graded index)
Maximum Attenuation — EFN062, EFP062: 5 dB/km; EFN4040: 3.5 dB/km
Minimum Bandwidth (3 dB) — 160 MHz/km
Minimum Bend Radius — 5 cm
Operating Temperature — -4° to 158° F (-20° to +70° C)

FAXBACK INFO
Request Document Number: 15499
Call 412-746-5500
Anytime

Item					Code	Price
Terminated Fiber Optic Cable						
ST-ST						
	Duplex	Riser	1-m	(3.2-ft.)	EFN062-001M-CC	**$69.95**
			3-m	(9.8-ft.)	EFN062-003M-CC	**$81.95**
			5-m	(16.4-ft.)	EFN062-005M-CC	**$87.95**
			10-m	(32.8-ft.)	EFN062-010M-CC	**$99.95**
			Custom Lengths		EFN062-CC	**$79.95 + $.70/ft.**
		Plenum	5-m	(16.4-ft.)	EFP062-005M-CC	**$92.95**
			10-m	(32.8-ft.)	EFP062-010M-CC	**$104.95**
			15-m	(49.2-ft.)	EFP062-015M-CC	**$134.95**
			Custom Lengths		EFP062-CC	**$79.95 + $.90/ft.**
	Simplex	Riser	1-m	(3.2-ft.)	EFN062-001M-C	**$35.95**
			3-m	(9.8-ft.)	EFN062-003M-C	**$45.95**
			5-m	(16.4-ft.)	EFN062-005M-C	**$47.95**
ST-SC						
	Duplex	Riser	1-m	(3.2-ft.)	EFN4010-001M	**$95.95**
			3-m	(9.8-ft.)	EFN4010-003M	**$102.95**
			5-m	(16.4-ft.)	EFN4010-005M	**$115.95**
			10-m	(32.8-ft.)	EFN4010-010M	**$139.95**

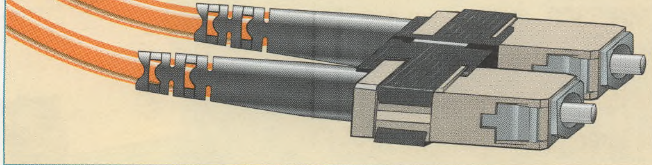
Item					Code	Price
Terminated Fiber Optic Cable						
SC-SC						
	Duplex	Riser	1-m	(3.2-ft.)	EFN4025-001M	**$109.95**
			3-m	(9.8-ft.)	EFN4025-003M	**$115.95**
		Plenum	5-m	(16.4-ft.)	EFP4020-005M	**$131.95**
			10-m	(32.8-ft.)	EFP4020-010M	**$155.95**
	Simplex	Riser	3-m	(9.8-ft.)	EFN4030-003M	**$86.95**
Terminated Fiber Optic Adapter Cables—*Custom-Built for You!*						
	Duplex	Riser				
			SMA905		EFN062-MM	**$95.00 + $.70/ft.**
			SMA906		EFN062-BB	**$95.00 + $.70/ft.**
			ST-SMA905 (ST, SMA905 Adapters)		EFN062-CM	**$95.00 + $.70/ft.**
			SMA906-ST (ST, SMA906 Adapters)		EFN062-BC	**$95.00 + $.70/ft.**
		Plenum				
			SMA905		EFP062-MM	**$95.00 + $.90/ft.**
			SMA906		EFP062-BB	**$95.00 + $.90/ft.**

Black Box Explains...

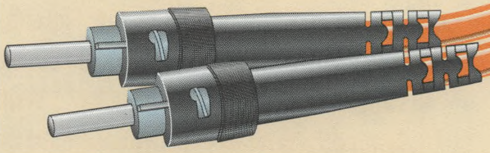
PLUS! Fiberoptic Adapters, see p. 76.

SC and ST Connectors.

The **SC Connector** features a molded body and a push-pull locking system. It's perfect for the office, CATV, and telephone applications.



The **ST® Connector** uses a bayonet locking system. Its ceramic ferrule ensures high performance.



Black Box Explains...

Why Fiber-Distributed Data Interface (FDDI) Is Coming on Strong.

Speed, distance, capacity: FDDI (Fiber-Distributed Data Interface) sends data at 100 Mbps over distances to 100 km (62 mi.) in networks of up to 1000 workstations—easily meeting the need for greater bandwidth. An FDDI network is set up in a token-passing ring topology. But it's also often used in conjunction with other networks as a back-end network connecting mainframes, a front-end network for workstations, or a backbone linking concentrators and gateways.

FDDI Jumper Cable • FDDI Cable with 45° Exit Assemblies

Build Your FDDI Network with BLACK BOX® FDDI Jumper Cable.

- **Meets all FDDI standards.**
- **Free-floating ferrule.**
- **Color-coded connector keys.**
- **100% compatible with FDDI PMD-ANSI X.166-1990 specifications.**
- **EFN4008: 45° strain-relief exit assembly *reduces cable stress* and space requirements.**

Don't compromise your high-speed FDDI network. Order your FDDI Jumper Cable from Black Box. Our Cable is certified to meet all the requirements of the FDDI PMD-ANSI X.166-1990 standard.

FAXBACK INFO
Request Document Number: 13590
Call 412-746-5500
Anytime

The FDDI connectors have a 2.5-mm ceramic free-floating ferrule that minimizes light loss. A fixed shroud surrounds the ferrule and protects it. A strain relief guards against cable damage. Color-coded connector keys are included.

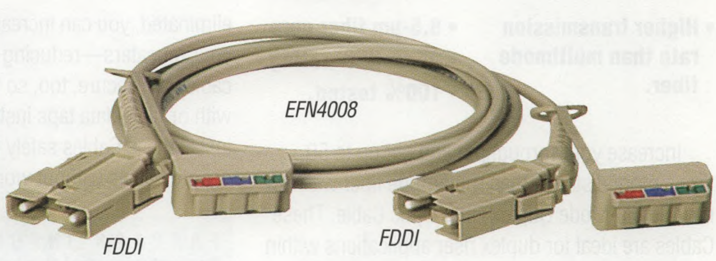
The Plenum cable is approved for use in air ducts (plenums) in your building. It meets all NEC® and UL® requirements for fire-resistance and smoke suppression.

The Riser cable is the right choice for running between floors and in non-plenum wall and ceiling spaces.

And with our BLACK BOX® Fiber-Distributed Data Interface (FDDI) cables, your fiber cable can exit at a 45-degree angle. That makes it easy to mate connectors to horizontally or vertically mounted coupling assemblies and transceivers. All FDDI keys are included for each connector. Unique storage clips hold keys securely on each connector.

PLUS! Bulk Cable, see pp. 114–123.

EFN4001
FDDI
FDDI



Item			Code	Price
FDDI Jumper Cable				
OFNR Riser	1-m	(3.2 ft.)	EFN4001-001M	$89.95
	2-m	(6.5 ft.)	EFN4001-002M	$94.95
	3-m	(9.8 ft.)	EFN4001-003M	$109.95
	5-m	(16.4 ft.)	EFN4001-005M	$119.95
	10-m	(32.8 ft.)	EFN4001-010M	$134.95
	15-m	(49.2 ft.)	EFN4001-015M	$159.95
OFNP Plenum	1-m	(3.2 ft.)	EFN4002-001M	$99.95
	2-m	(6.5 ft.)	EFN4002-002M	$104.95
	3-m	(9.8 ft.)	EFN4002-003M	$109.95
	5-m	(16.4 ft.)	EFN4002-005M	$119.95
	10-m	(32.8 ft.)	EFN4002-010M	$134.95
	15-m	(49.2 ft.)	EFN4002-015M	$159.95
FDDI Cable with 45° Exit Assemblies				
	1-m	(3.2 ft.)	EFN4008-001M	$109.95
	2-m	(6.5 ft.)	EFN4008-002M	$119.95
	3-m	(9.8 ft.)	EFN4008-003M	$129.95
	5-m	(16.4 ft.)	EFN4008-005M	$139.95
	10-m	(32.8 ft.)	EFN4008-010M	$154.95
	15-m	(49.2 ft.)	EFN4008-015M	$169.95

PLUS! Fiber Cable Testers, see p. 215.

FDDI Adapter Cable

ST and FDDI Compatibility Problems? Here's Your Solution.

- **ST connectors on one end, FDDI on the other.**
- **No more compatibility problems!**

Installation problems? Equipment-compatibility problems? Here's the Black Box solution. This cable has an FDDI connector on one end and a Y with two ST® connectors on the other. Instantly, your ST equipment is FDDI-compatible.

The FDDI connectors have a 2.5-mm ceramic free-floating ferrule to minimize light loss, and a fixed shroud surrounds the ferrule and protects it. A strain relief guards against cable damage. Color-coded connector keys are included.

EFN4004
FDDI
ST®

Item			Code	Price
FDDI Adapter Cable				
OFNR Riser	1-m	(3.2 ft.)	EFN4003-001M	$89.95
	2-m	(6.5 ft.)	EFN4003-002M	$94.95
OFNP Plenum	1-m	(3.2 ft.)	EFN4004-001M	$119.95
	2-m	(6.5 ft.)	EFN4004-002M	$129.95

Black Box Explains...

Single-Mode Fiberoptic Cable.

While multimode fiber cable has multiple modes of propagation—that is, several wavelengths of light are normally used in the fiber core, single-mode fiber cable has only one mode of propagation—a single wavelength of light in the fiber core. This means there's no interference or overlap between the different wavelengths of light to garble your data over long distances as can happen with multimode cable.

What does this get you? Distance—up to 50 times more distance than multimode fiber cable.

You can also get higher bandwidth. You can use a pair of single-mode fiber strands full-duplex for up to twice the throughput of multimode fiber cable.

The actual speed and distance you get with single-mode fiber will vary according to the manufacturer of the LAN devices or fiber modems used with the cable. This is because while there is an established standard for multimode fiber, there is, as of yet, none established for single-mode fiber.

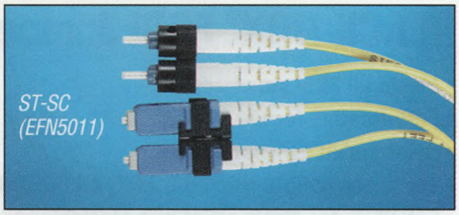
Single-Mode Duplex Fiber Optic Cable

Discover the Speed and Distance Advantages of Single-Mode Fiber!

- **Higher transmission rate than multimode fiber.**
- **8.5-µm fiber core.**
- **OFNR NEC® rating.**
- **100% tested.**

Increase your throughput and get up to 50 times more distance than multimode fiber with our new Single-Mode Duplex Fiber Optic Cable. These Cables are ideal for duplex riser applications within buildings. Because wavelength interference is eliminated, you can increase the distance between your repeaters—reducing equipment costs. These cables are secure, too, so they can't be tampered with or have data taps installed. And you can install these Cables safely with other fiber and/or copper cables without worrying about crosstalk.

FAXBACK INFORMATION
Request Document Number: 17116
Call 412-746-5500 Anytime



Item			Code	Price
Single-Mode Duplex Fiber Optic Cable, PVC				
	ST®-ST	1-m	EFN5009-001M	**$149.95**
		Custom Lengths	EFN5009	**$159.95 + 8.95/m**
	SC-SC	1-m	EFN5010-001M	**$149.95**
		Custom Lengths	EFN5010	**$159.95 + 8.95/m**
	ST-SC	1-m	EFN5011-001M	**$149.95**
		Custom Lengths	EFN5011	**$159.95 + 8.95/m**

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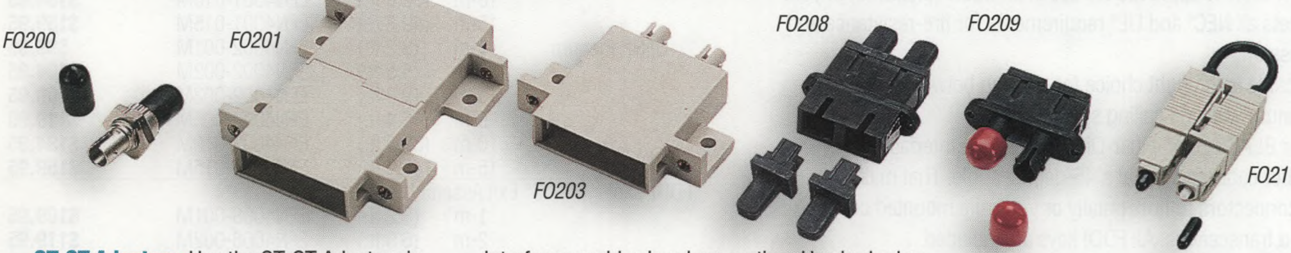
Fiberoptic Adapters

Use Our Adapters to Link Your Fiberoptic Cables.



ST-ST Adapters: Use the ST-ST Adapters in multimode applications to couple bushings.

ST-SC Adapters: The ST-SC Adapters convert the SC style and ST style in either single-mode or multimode applications. The ST-SC Duplex Adapter accepts two simplex connectors, or one duplex connector. Mounting screws are available.

SC-SC Coupling Receptacles: Come with ceramic alignment sleeves. Can be used with all SC-type connectors. Use in single- and multimode applications. The Duplex model accepts two simplex connectors, or one duplex connector.

FSD Duplex Receptacles: Features fixed keys. A self-aligning, free-floating interface provides low-loss mating. Mates two duplex FSD plugs. Includes mounting ears with 4-40 pre-threaded inserts.

FDDI-ST Adapters: Four keying options available. And they meet stringent ANSI X3T9 specifications. A self-aligning, free-floating interface provides low-loss mating. Use in duplex mode. Connects FSD connectors to two ST style connectors. Includes mounting ears with 4-40 pre-threaded inserts.

SC Multimode Loopback Connector: Use for multimode fiberoptic network application and equipment testing. Includes 0.5-dB insertion loss, and 0.5" ferrule centerline.

SPECIFICATIONS

Gender — F0210, F0208, F0207: F/F receptacle; F0201, F0203: Receptacle

Connectors — F0210: SC to ST Duplex;
F0208: SC to SC Duplex;
F0207: SC to SC Simplex;
F0203: FSD Duplex keyed for a dual ST style receptacle;
F0201: FSD Duplex keyed A to B

Size — F0210, F0208: 0.4"H x 1"W x 1.2"D (0.9 x 2.5 x 3 cm);
F0207: 0.4"H x 0.5"W x 1.2"D (0.9 x 1.3 x 3 cm);
F0201, F0203: 2.9"H x 0.4"W x 1.5"D (7.4 x 1 x 3.8 cm)

FAXBACK INFORMATION
Request Document Number: 15509
Call 412-746-5500 Anytime

Item	Mode/Keying	Code	Price
ST-ST Multimode Adapter			
	Simplex	F0200	**$11.95**
ST-SC Adapter			
	Duplex	F0209	**$54.95**
	Simplex	F0210	**$34.95**
SC-SC Coupling Receptacle			
	Duplex	F0208	**$50.95**
	Simplex	F0207	**$34.95**
FSD Duplex Receptacle			
	Key A to B	F0201	**$34.95**
	Key M to S	F0202	**$34.95**
FDDI-ST Bulkhead Adapter			
	Keying Type A	F0203	**$29.95**
	Keying Type B	F0204	**$29.95**
	Keying Type M	F0205	**$29.95**
	Keying Type S	F0206	**$29.95**
SC Multimode Loopback Connector			
		F0211	**$99.95**

ThinNet Cable

Here's the Cabling You Need—ThinNet.

- **High-quality coax cable for ThinNet (10BASE2 Ethernet).**
- **Dual ThinNet cable connects a T-connector on the NIC to a dual BNC Wallplate (WP360, below or WP220 and WP230, page 144).**

These cables are used for 10BASE2 Ethernet environments in small networks. Connect these cables from your ThinNet Network Interface Card (NIC) to your coax wallplate—and from the wallplate to the wiring closet.

ABSOLUTELY GUARANTEED FOR LIFE

PLUS! Bulk ThinNet Cable, see p. 120.

Item			Code	Price
ThinNet Cable (NEC® CL2 & CL2P)				
PVC	10-ft.	(3.0-m)	LCN300-0010	**$17.95**
	15-ft.	(4.6-m)	LCN300-0015	**$19.95**
	20-ft.	(6.1-m)	LCN300-0020	**$20.95**
	25-ft.	(7.6-m)	LCN300-0025	**$22.95**
	30-ft.	(9.1-m)	LCN300-0030	**$23.95**
	40-ft.	(12.2-m)	LCN300-0040	**$27.95**
	60-ft.	(18.3-m)	LCN300-0060	**$32.95**
	100-ft.	(30.5-m)	LCN300-0100	**$44.95**
	Custom Lengths		LCN300	**$17.00 + $.33/ft.**
Plenum	20-ft.	(6.1-m)	LCN350-0020	**$25.95**
	60-ft.	(18.5-m)	LCN350-0060	**$45.95**
	100-ft.	(30.5-m)	LCN350-0100	**$67.95**
	Custom Lengths		LCN350	**$16.15 + $.58/ft.**
Dual ThinNet	6-ft.	(1.8-m)	LCN302-0006	**$33.95**
	10-ft.	(3.0-m)	LCN302-0010	**$35.95**
	20-ft.	(6.1-m)	LCN302-0020	**$41.95**
	Custom Lengths		LCN302	**$32.30 + $.65/ft.**

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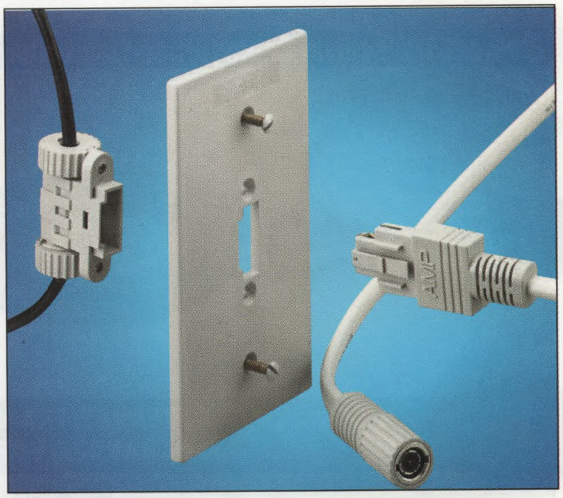
FastTap for ThinNet

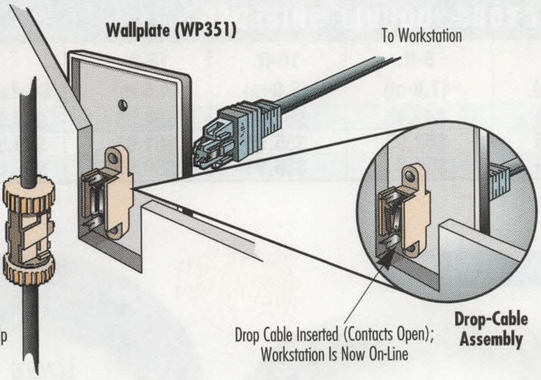
The Easiest Way to Terminate and Install Cable. No Soldering, No Downtime.

- **No T-connector. Drop cable connects directly to BNC on Ethernet card.**
- **Specially molded plugs and dual coaxial drop cables ensure mistake-free installation.**
- **Up to 30 FastTaps per segment.**

Instant connection! Just strip the cable jacket, slip the wire into the tap assembly, and squeeze. Make-before-break switching means that even if the drop cable comes out on the PC side, your LAN stays up.



ThinNet Installation with FastTap


Wallplate (WP351)
To Workstation
FastTap Barrel Assembly (WP350)
Drop Cable Not Inserted (Contacts Closed); LAN Is Up
Drop Cable Inserted (Contacts Open); Workstation Is Now On-Line
Drop-Cable Assembly

Item			Code	Price
FastTap Barrel Assembly			WP350	**$15.95**
Wallplate			WP351	**$3.95**
Drop-Cable Assemblies				
	6-ft.	(1.8-m)	FJ200	**$44.95**
	8-ft.	(2.4-m)	FJ201	**$50.95**
	16-ft.	(4.9-m)	FJ202	**$54.95**
	25-ft.	(7.6-m)	FJ204	**$61.95**
Terminator			FJ206	**$4.95**
Terminator with Ground Strap			FJ207	**$8.95**

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Keep-Alive Wallplate

Cut ThinNet Downtime! Add or Remove Workstations without Disrupting Your Network.

- **Make-before-break switch keeps your network running.**
- **Quick installation.**

Easily add or eliminate workstations! The make-before-break switch built into the Wallplate maintains the ThinNet bus when any workstation is disconnected, keeping your network up and running.

Installation is easy—no soldering required. Two female BNC connectors inside the box allow for instant connection of terminated ThinNet cables. Silver-plated switch contacts assure reliable, low-resistance connections every time.

SPECIFICATIONS

Electrical — Insertion loss equal to or less than 0.1 dB @ 50 MHz
Impedance — 50 ohms
Connectors — (4) BNC female (2 on the back, 2 on the front)
Size — 4.5"H x 2.8"W x 1.3"D (11.4 x 7.1 x 3.3 cm)

Item	Code	Price
Keep-Alive Wallplate	WP360	**$51.00**

Black Box Is Your *Complete* Source for High-Quality Ethernet Cabling.

Standard Ethernet Backbone Coax Cable

- Use as an Ethernet (10BASE5) 12AWG trunk or backbone cable.
- N-type male connectors.
- Marked every 8.2 feet (2.5 m) for transceiver connections.

Item			Code	Price
Standard Ethernet Backbone Coax Cable (NEC® CL2 & CL2P)				
PVC	802.3	77-ft. (23.5-m)	LCN100-0077	**$120.95**
		230-ft. (70.1-m)	LCN100-0230	**$294.95**
		384-ft. (117.0-m)	LCN100-0384	**$469.95**
		Custom Lengths	LCN100	**$34.45 + $1.13/ft.**
Plenum	802.3	77-ft. (23.5-m)	LCN150-0077	**$179.95**
		230-ft. (70.1-m)	LCN150-0230	**$496.95**
		384-ft. (117.0-m)	LCN150-0384	**$799.95**
		Custom Lengths	LCN150	**$32.30 + $2.27/ft.**

ABSOLUTELY GUARANTEED FOR LIFE

PLUS! Bulk Ethernet Cable, **see pp. 119–120.**

Ethernet Transceiver Cable (Office Environment) (NEC® CL2 & CL2P)

LCN210
LCN215

ABSOLUTELY GUARANTEED FOR LIFE

- Stranded copper conductors provide maximum flexibility and are lightweight.
- Made of 8 conductors, individually shielded with drain wire and a double cable shield.
- Features 3 pairs of 28 AWG wire and 1 pair of 24 AWG wire.
- PVC jacket for riser applications.

FAXBACK INFO
Request Document Number: 11079
Call 412-746-5500
Anytime

BUYER'S GUIDE

ETHERNET TRANSCEIVER CABLE (OFFICE ENVIRONMENT) STRANDED COPPER CONDUCTORS, DOUBLE SHIELDED

Code	Type	Standard	Connectors		3-ft. (0.9-m)	6-ft. (1.8-m)	10-ft. (3.0-m)	15-ft. (4.5-m)	Custom Lengths
			Straight	Right-Angle					
LCN210	PVC	Version 2.0	✔		**$47.95**	**$49.95**	**$51.95**	**$54.95**	**$49.55 + $.65/ft.**
LCN215	PVC	IEEE 802.3	✔		**$49.95**	**$52.95**	**$55.95**	**$61.95**	**$49.55 + $.65/ft.**
LCN216	PVC	IEEE 802.3		✔	**$52.95**	**$54.95**	**$56.95**	**$59.95**	**$56.00 + $.64/ft.**

Ethernet Transceiver Cable (Industrial Environment)

HEAVY-DUTY

- Use this Ethernet Transceiver Cable in industrial environments.
- Triple shielded for maximum protection in harsh environments.
- Constructed of stranded, tinned, 20 AWG, annealed copper conductors.
- Use at a maximum distance of 150 feet (45 m).

FAXBACK INFO
Request Document Number: 11079
Call 412-746-5500
Anytime

ABSOLUTELY GUARANTEED FOR LIFE

LCN200
LCN206

BUYER'S GUIDE

ETHERNET TRANSCEIVER CABLE (INDUSTRIAL ENVIRONMENT) TRIPLE SHIELDED FOR MAXIMUM PROTECTION IN HIGH-NOISE AREAS

Code	Type	Standard	Connectors		10-ft. (3.0-m)	15-ft. (4.5-m)	30-ft. (9.0-m)	50-ft. (15.3-m)	150-ft. (45.7-m)	Custom Lengths
			Straight	Right-Angle						
LCN200	PVC	Version 2.0	✔		**$55.95**	**$61.95**	**$76.95**	**$89.95**	**$189.95**	**$51.70 + $1.03/ft.**
LCN250	Plenum	Version 2.0	✔		**$62.95**	**$79.95**	**$99.95**	**$137.95**	**$324.95**	**$44.15 + $2.16/ft.**
LCN205	PVC	IEEE 802.3	✔		**$55.95**	**$61.95**	**$76.95**	**$89.95**	**$189.95**	**$51.70 + $1.03/ft.**
LCN206	PVC	IEEE 802.3		✔	**$62.95**	**$79.95**	**$99.95**	**$137.95**	**$324.95**	**$58.15 + $1.03/ft.**
LCN255	Plenum	IEEE 802.3	✔		**$64.95**	**$78.95**	**$109.95**	**$149.95**	**$349.95**	**$51.70 + $2.16/ft.**
LCN256	Plenum	IEEE 802.3		✔	**$71.95**	**$84.95**	**$115.95**	**$159.95**	**$359.95**	**$58.15 + $2.16/ft.**

Coaxial Cable • WANG Compatible Cable

Coax Cable Custom-Made for IBM 3270 and WANG Systems.

ETN59
EVNCDC

- Choose standard precut lengths, or the exact length you need.
- Use with IBM® 3270 equipment, WANG® equipment, or even Black Box Coax Protocol Converters (**pp. 350–351**), or Coax Switches (**pp. 246–247**).

PLUS! Bulk Coaxial Cable, **see pp. 119–120.**

SPECIFICATIONS

Cable Construction — ETN59: RG59 a/u black PVC coaxial; ETN62: RG62 a/u black PVC; ETN660: CL2P plenum coax (RG62 a/u); EVNCDC, EVNPCP: Black PVC

Conductor Gauge — ETN59, EVNCDC, EVNPCP: 23 AWG solid copper; ETN62, ETN660: 22 AWG solid copper

Impedance — ETN59: 75 ohms; ETN62, ETN660: 93 ohms; EVNCDC, EVNPCP: 75 ohms

Mutual Capacitance — ETN59, EVNCDC: 21.5 pF/ft.; ETN62, ETN660: 13.5 pF/ft.; EVNPCP: 19.6 pF/ft.

Outside Diameter — ETN59, ETN62: 0.242"; ETN660: 0.203"; EVNCDC: 0.495"; EVNPCP: 0.450" nominal

Resistance — ETN59: 54.5 ohms/1000 ft.; ETN62: 62.7 ohms/1000 ft.; ETN660: 42.3 ohms/1000 ft.; EVNCDC: 54.5 ohms/1000 ft. max; EVNPCP: 52.5 ohms/1000 ft.

Shield — 34 AWG braided annealed copper

CE Approval — ETN660

Connectors — ETN59: BNC RG59; ETN62, ETN660: BNC Coax; EVNCDC, EVNPCP: (1) BNC, (1) TNC

NOTE: Coaxial Cables are for indoor use only. Specify BNC or TNC for Coax Cables. WANG cables feature (1) BNC and (1) TNC connector.

Item		Code	Price
Coaxial Cable			
RG59 PVC (CL2)	6-ft. (1.8-m)	ETN59-0006-BNC	**$8.95**
	10-ft. (3.0-m)	ETN59-0010-BNC	**$9.95**
	20-ft. (6.1-m)	ETN59-0020-BNC	**$11.95**
	Custom Lengths	ETN59-BNC	**$8.10 + $.22/ft.**
RG62 PVC (CL2)	6-ft. (1.8-m)	ETN62-0006-BNC	**$8.95**
(IBM Part #2577672)	10-ft. (3.0-m)	ETN62-0010-BNC	**$9.95**
	20-ft. (6.1-m)	ETN62-0020-BNC	**11.95**
	Custom Lengths	ETN62-BNC	**$8.10 + $.22/ft.**
RG62 Plenum (CL2P) *(IBM Part #1743645)*	Custom Lengths	ETN660	**$8.10 + $.57/ft.**
Dual WANG Compatible Cable			
PVC (CL2)	*(WANG Part #120-2300-X)*	EVNCDC	**$15.95 + $.49/ft.**
Plenum (CL2P)	*(WANG Part #120-2303-X)*	EVNPCP	**$15.95 + $2.36/ft.**

See our ThinNet Coax Cables on page 77.

◆ ◆ ◆

Twinaxial Cable

Here's Twinax Cable for Your IBM System 3X or AS/400®.

PLUS! Bulk Twinaxial Cable, **see pp. 119–120.**

SPECIFICATIONS

Cable Construction — PVC or plenum

Conductor Gauge — 20 AWG stranded copper

Impedance — 100 ohms

Mutual Capacitance — ±15.5 pF/ft.

Outside Diameter — 0.330"

Shield — 34 AWG braided tinned copper

CE Approval — EWN010

Connectors — Twinaxial

Item		Code	Price
Twinaxial Cable			
PVC (CL2)	6-ft. (1.8-m)	EWN010-0006-MM	**$42.95**
(IBM Part #7362062)	10-ft. (3.0-m)	EWN010-0010-MM	**$44.95**
	20-ft. (6.1-m)	EWN010-0020-MM	**$49.95**
	Custom Lengths	EWN010-MM	**$45.95 + $.49/ft.**
PVC (CL2)	6-ft. (1.8-m)	EWN010-0006-MF	**$42.95**
	10-ft. (3.0-m)	EWN010-0010-MF	**$44.95**
	20-ft. (6.1-m)	EWN010-0020-MF	**$49.95**
	Custom Lengths	EWN010-MF	**$45.95 + $.49/ft.**
PVC (CL2)	6-ft. (1.8-m)	EWN010-0006-FF	**$42.95**
(IBM Part #362267)	10-ft. (3.0-m)	EWN010-0010-FF	**$44.95**
	20-ft. (6.1-m)	EWN010-0020-FF	**$49.95**
	Custom Lengths	EWN010-FF	**$49.95 + $.49/ft.**
Plenum (CL2) (MM only)	Custom Lengths	EWN020	**$45.25 + $1.73/ft.**

◆ ◆ ◆

TV/VCR Connection Cables

Make Golden TV/VCR Hookups with Premium Black Box Cables.

- **Designed for RG59/U cable.**
- **Fully shielded with braided copper.**
- **24-karat gold-plated connectors.**
- **Use the F-type plug version to connect VCRs and TVs, video amplifiers, antennas, and more.**
- **Use the RCA® plug version to carry one channel of audio between a stereo TV or VCR audio output and a stereo system, or as an extension to an existing cable terminated with RCA jacks.**

This is the highest quality 75-ohm video connector cable you can get. It features 24-karat gold-plated F-type plugs with fully shielded, braided copper to keep interference at an *absolute* minimum.

Item		Code	Price
TV/VCR Connection Cables			
Screw-On RG59 Plugs			
	3-ft. (0.9-m)	EJ200	**$4.95**
	6-ft. (1.8-m)	EJ200-0006	**$6.95**
	12-ft. (3.6-m)	EJ200-0012	**$8.95**
	25-ft. (7.6-m)	EJ200-0025	**$16.95**
Slip-On RG59 Plugs			
	3-ft. (0.9-m)	EJ202-0003	**$4.95**
	6-ft. (1.8-m)	EJ202-0006	**$6.95**
	12-ft. (3.6-m)	EJ202-0012	**$8.95**
	25-ft. (7.6-m)	EJ202-0025	**$16.95**

Black Box Explains...

Type 1 vs. Type 6 Cable.

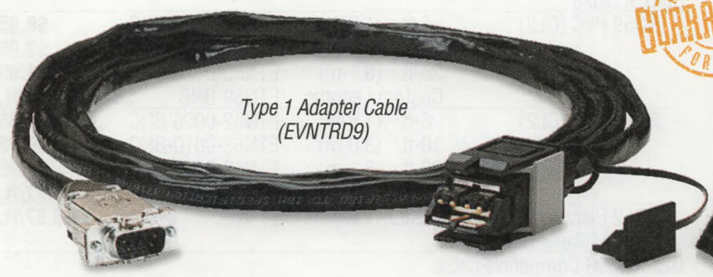
Type 1 Cable is made of solid wire, typically 22 AWG bare copper. It has braided shielding around each pair. It's recommended for long runs in walls, conduits, etc.

Type 6 Cable is typically made of 26 AWG stranded copper and has one shield around both pairs. It is lighter and more flexible than Type 1 cable and has a better "look." It's recommended for use in office environments.

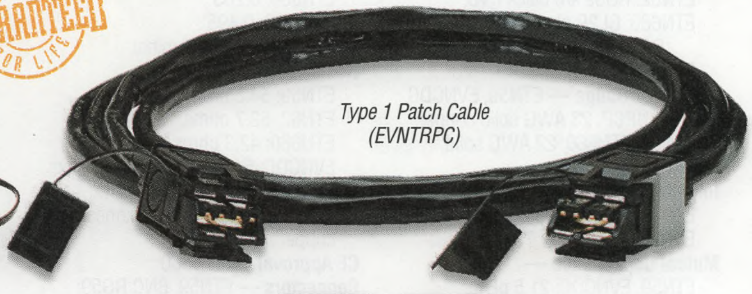
Type 1 and Type 6 Token Ring Cable (Adapter • Patch)

Token Ring MAU and NIC Connections Made Easy—for the Long and Short Haul.

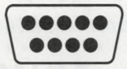
PLUS! Bulk Type A Token Ring Cables, see p. 123.



Type 1 Adapter Cable (EVNTRD9)

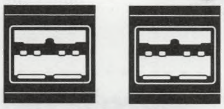


Type 1 Patch Cable (EVNTRPC)



DB9 Male

Data Connector



Data Connectors

Adapter Cable

- Use Adapter Cables to connect your DB9 NICs to a data-connector wallplate or MAU in a Token Ring environment.
- For your Token Ring network.
- Each Cable has an IBM-type data connector on one end and a DB9 male on the other.
- Choose standard Type 1 or smaller, flexible Type 6.
- Custom lengths are available.

Patch Cable

- Use Patch Cables to connect two Type 1 MAUs.
- Use smaller Type 6 cable for more flexibility in your installation.
- Cables have data connectors on both ends.
- Custom lengths are available.

SPECIFICATIONS

Attenuation (db/1000 ft.) —
EVNTRD9: At 4 MHz, 6.7,
At 16 MHz, 13.4;
EVNTR02: At 4 MHz, 10,
At 16 MHz, 20;
EVNTRPC: At 4 MHz, 6.7,
At 16 MHz,13.4;
EVNTR01: at 4 MHz, 10,
At 16 MHz, 20

Conductor Gauge —
EVNTRD9: 22 AWG;
EVNTR02: 26 AWG;
EVNTRPC: 22 AWG;
EVNTR01: 26 AWG

Connectors — EVNTRD9, EVNTR02: Data connector to DB9;
EVNTRPC, EVNTR01: (2) Data connectors

Item	Code	Price
Adapter Cable		
Type 1 *(IBM® Part #6339098)*		
8-ft. (2.4-m)	EVNTRD9-0008	**$33.95**
30-ft. (9.1-m)	EVNTRD9-0030	**$42.95**
75-ft. (22.9-m)	EVNTRD9-0075	**$64.95**
150-ft. (45.7-m)	EVNTRD9-0150	**$99.95**
Custom Lengths	EVNTRD9	**$32.30 + $.48/ft.**
Type 6 *(IBM® Part #6339098)*		
8-ft. (2.4-m)	EVNTR02-0008	**$39.95**
30-ft. (9.1-m)	EVNTR02-0030	**$48.95**
75-ft. (22.9-m)	EVNTR02-0075	**$66.95**
150-ft. (45.7-m)	EVNTR02-0150	**$96.95**
Custom Lengths	EVNTR02	**$37.20 + $.44/ft.**
Patch Cable		
Type 1 *(IBM® Part #8642551)*		
8-ft. (2.4-m)	EVNTRPC-0008	**$39.95**
30-ft. (9.1-m)	EVNTRPC-0030	**$42.95**
75-ft. (22.9-m)	EVNTRPC-0075	**$64.95**
150-ft. (45.7-m)	EVNTRPC-0150	**$99.95**
Custom Lengths	EVNTRPC	**$40.90 + $.48/ft.**
Type 6 *(IBM® Part #8642551)*		
3-ft. (0.9-m)	EVNTR01-0003	**$33.95**
8-ft. (2.4-m)	EVNTR01-0008	**$35.95**
15-ft. (4.6-m)	EVNTR01-0015	**$39.95**
30-ft. (9.1-m)	EVNTR01-0030	**$45.95**
Custom Lengths	EVNTR01	**$34.45 + $.44/ft.**

PLUS! Need Custom Cables? See the Custom Cable Form between **pp. 66 and 67.**

> ***"Our systems demand clean, low-noise signals. Black Box produced custom cables to meet our exact specifications. The results have been outstanding—quality workmanship and reliability."***

Token Ring DB9-DB9 Local Cable

How to Get to the Hub of Activity.

- **The cable of choice for the 2-Port Hub.**
- **Priced right and can be custom-cut to fit your needs.**

ABSOLUTELY GUARANTEED FOR LIFE

When 2-Port Hubs are used to add workstations to your Token Ring, the BLACK BOX® DB9-DB9 Local Cable makes the connection.

The Local Cable is terminated at each end with a DB9 connector (one end is male, one is female) and made with Type 1 data cable.

We custom-cut the DB9-DB9 Local Cable to your specifications—and we guarantee it for life!

PLUS! 2-Port Hub, see p. 597.

SPECIFICATIONS

Capacitance — 8.5 pF/1 KHz
Conductor Gauge — 22 AWG
Conductor Material — Solid copper
Construction — 4-pairs, foil and braid shielded
Diameter — 0.465"
Impedance — 150 ohms
Jacket Material — PVC

NOTE: Please specify male/male, male/female, or female/female when ordering.

Item	Code	Price
Token Ring DB9-DB9 Local Cable		
8-ft. (2.4-m)	EVNTR99-0008	**$32.30**
10-ft. (3.0-m)	EVNTR99-0010	**$33.40**
15-ft. (4.6-m)	EVNTR99-0015	**$36.60**
20-ft. (6.0-m)	EVNTR99-0020	**$38.75**
25-ft. (7.6-m)	EVNTR99-0025	**$40.90**
30-ft. (9.1-m)	EVNTR99-0030	**$43.05**
Custom Lengths	EVNTR99	**$32.30 + $.48/ft.**

* * *

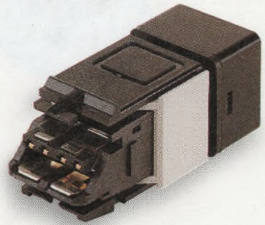
Data Connector to RJ-45 Adapter

- **The inexpensive alternative to purchasing Type 3 equipment.**
- **Slash hours from your installation time.**

Convert any Type 1 port to a Type 3 modular connection, ready for economical Type 3 unshielded twisted pair. Build and test a Type 3 mini-LAN without paying for Type 3 equipment. Order several Adapters, and use a few ports on a Type 1 MAU to create test segments. Slash hours from your installation time—no mounting, wiring, or cabling new MAUs. The Adapter also works in wallboxes, on patch cables, or in patch panels.

The Low-Cost Way to Run Twisted Pair on Your Token Ring Network.

DATA CONNECTOR	RJ-45
Red	5 (Red)
Green	4 (Green)
Orange	3 (Orange)
Black	6 (Black)



Item	Code	Price
Data Connector to RJ-45 Adapter	FJ012	**$25.15**
Category 4, RJ-45, 4-Pair, 8-Wire 25-ft. (7.6-m)		
PVC	EYN715MS-0025	**$10.50**
Plenum	EYN735MS-0025	**$11.50**

remember to order cables

* * *

IBM Cabling Baluns and Adapters

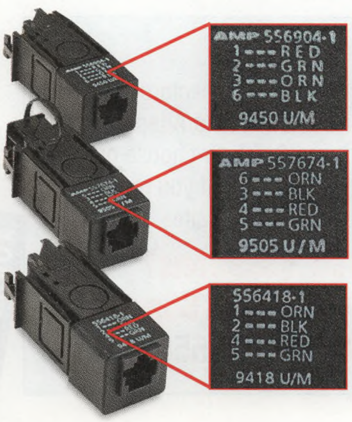
Your Reliable Quick Fix for Matching Type 1 and UTP Cables.

PLUS! Media Filters, see p. 597.

- Switch from Type 1 to UTP (or from UTP to Type 1) in an instant—just plug in the right adapter or balun.
- Baluns have 105- to 150-ohm impedance transformer.
- Adapters convert one connector type.

Item		Code	Price
Baluns (105/150 Ohms)—Data Connector/RJ-45			
10BASE-T	(Pins 1+2, 3+6)	FJ013	**$37.95**
Token Ring	(Pins 3+6, 4+5)	FJ014	**$37.95**
	(Pins 1+2, 4+5)	FJ015	**$37.95**
Adapters—Data Connector			
RJ-11	(6-Wire)	FJ016	**$24.95**
RJ-45	(1+2, 4+5)	FJ017	**$24.95**
	(TR) (3+6, 4+5)	FJ018	**$24.95**
16/4 Meg Media Filter RJ-11		LT056A	**$49.95**
Type 3 Media Filter RJ-45		LT057	**$49.95**

Baluns

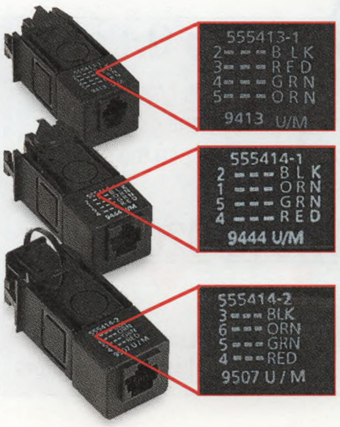


10BASE-T (1+2, 3+6 Pins) (FJ013)

Token Ring (3+6, 4+5 Pins) (FJ014)

Token Ring (1+2, 4+5 Pins) (FJ015)

Adapters



RJ-11 (6-Wire) (FJ016)

RJ-45 (1+2, 4+5) (FJ017)

RJ-45 (TR) (3+6, 4+5) (FJ018)

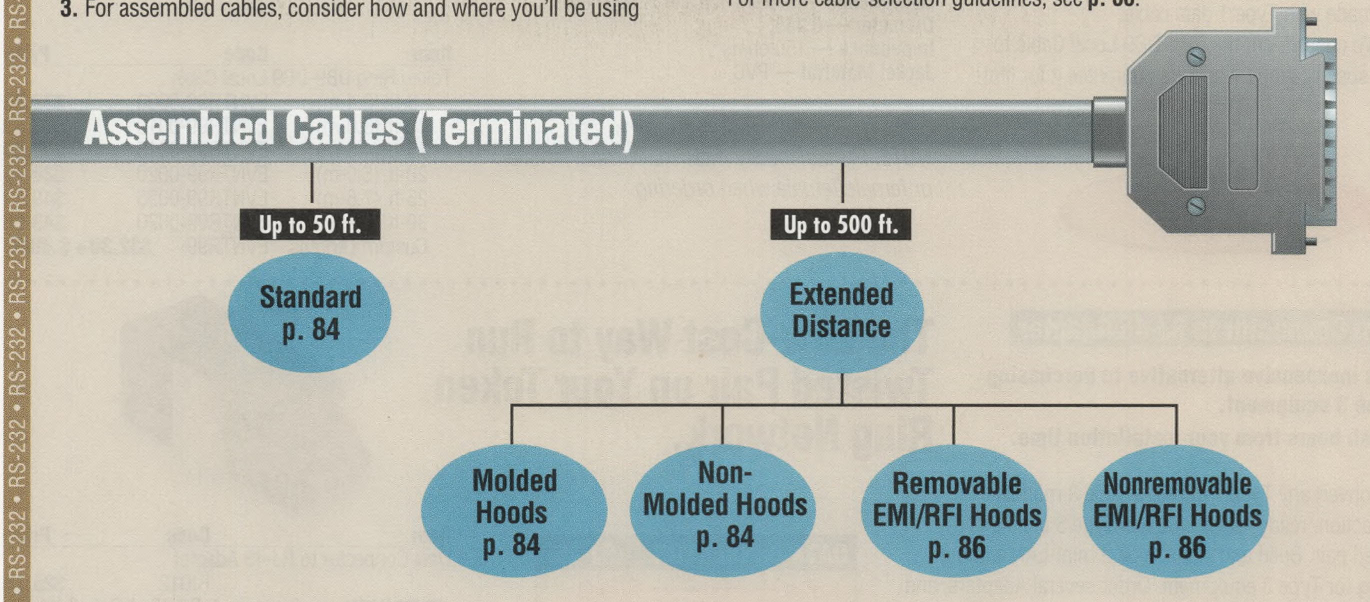
Here Are All the RS-232 Cables You Need!

RS-232 cable is one of the most commonly used cables *ever.* Its specification applies primarily to private-line, dialup, point-to-point, multipoint, switched, nonswitched, two-wire, and four-wire service.

Here's the easy way to find exactly the RS-232 cable you need. Instead of flipping through pages, just take a look at this chart.

1. Decide if you want terminated or unterminated cable.
2. Determine the distance you need: 10 feet, 50 feet, 500 feet, or even up to 4000 feet.
3. For assembled cables, consider how and where you'll be using the cable. If you're going to run the cable in a quiet office and don't plan to make changes, choose our standard or extended-distance cables with molded hoods. If you plan to make changes, or need extra protection from noise, choose removable EMI/RFI hoods.
4. When buying bulk cables, consider if you need fire-resistance, and if you'll be running the cable in quiet or noisy environments. That will help you decide between plenum and PVC cable, and shielded and unshielded cable.

For more cable-selection guidelines, see **p. 66**.



Assembled Cables (Terminated)

Up to 50 ft.

Standard
p. 84

Up to 500 ft.

Extended Distance

Molded Hoods
p. 84

Non-Molded Hoods
p. 84

Removable EMI/RFI Hoods
p. 86

Nonremovable EMI/RFI Hoods
p. 86

Buy in Bulk and Save!

NEW!

Bulk Cable Section (Unterminated) See pages 114–123.

BUYER'S GUIDE

How to Order Cables:

Choose the type of cable, the length, and the gender of connectors. Then compose the order code this way:

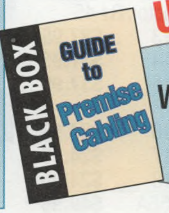
EDN04C-0200-MF

- EDN04C: Type of cable
- 0200: Length in feet
- MF: Gender of connectors

For other lengths, connectors, pinning, etc., see our **Custom Cable/Adapter Form between pages 66–67**. Or choose our Bulk Cables (**pages 114–123**) if you prefer to mount the connectors on site.

Any questions?
Call Technical Support at 412-746-5500.

MORE! For Explanations of Cable Options, **see p. 66.**



Updated! Make connections! We'll teach you how to install your own wiring system. See page 635.

Standard RS-232 Low-Noise Cable

The Best Choice for Runs up to 50 Feet in Low-Noise Environments.

Flexible

For Short Runs, Repinnable

ABSOLUTELY GUARANTEED FOR LIFE

- **Supports distances up to 50 feet (15.2 m).**
- **22 AWG, with unshielded PVC jacket.**
- **All conductors are straight-wired.**
- **Hundreds of stock lengths and all gender combinations are available.**

STRANDED

Now more flexible! Our RS-232 cable is now more flexible than ever. It's the smart selection for offices and low-noise applications. You can run a cable from a PC to a modem up to 50 feet (15.2 m) away.

It has straight-wired conductors, so you can use our RS-232 Cable to run from the parallel output of your computer to a switch box. If you're troubleshooting and need to check a particular lead, the connector hoods can be opened and cables can be repinned.

The RS-232 specification applies to private-line, dialup, point-to-point, multipoint, switched, nonswitched, two-wire, and four-wire service. Asynchronous and synchronous data can run at 20 Kbps, full- or half-duplex. The RS-232 interface can be single-ended or balanced, and all the signals share a common ground.

This cable is suitable for connecting to DTE and DCE equipment.

NOTE: Specify gender when ordering.

Item	Code	Price
RS-232 Cables (NEC® CL2)		
25 Conductors; Pinning: Pins 1–25		
2-ft. (0.6-m)	ECM25C-0002	**$18.95**
5-ft. (1.5-m)	ECM25C-0005	**$20.95**
10-ft. (3.0-m)	ECM25C-0010	**$23.95**
15-ft. (4.6-m)	ECM25C-0015	**$26.95**
20-ft. (6.1-m)	ECM25C-0020	**$29.95**
25-ft. (7.6-m)	ECM25C-0025	**$33.95**
35-ft. (10.6-m)	ECM25C-0035	**$39.95**
50-ft. (15.2-m)	ECM25C-0050	**$49.95**
Custom Lengths	ECN25C	**$19.40 + $.71/ft.**
16 Conductors; Pinning: Pins 1–8, 15, 17, 20–25		
2-ft. (0.6-m)	ECM16C-0002	**$17.95**
5-ft. (1.5-m)	ECM16C-0005	**$18.95**
10-ft. (3.0-m)	ECM16C-0010	**$20.95**
15-ft. (4.6-m)	ECM16C-0015	**$22.95**
20-ft. (6.1-m)	ECM16C-0020	**$24.95**
25-ft. (7.6-m)	ECM16C-0025	**$27.95**
35-ft. (10.6-m)	ECM16C-0035	**$31.95**
50-ft. (15.2-m)	ECM16C-0050	**$37.95**
Custom Lengths	ECN16C	**$18.30 + $.49/ft.**

Order the right number of conductors for your application:

The DB25 connector supports a maximum of 25 signal leads, but many applications require fewer. Usually your equipment's technical documentation will indicate the number of leads it needs.

25-Conductor Cable

This type of cable supports all 25 leads on the DB25 connector. It's ideal for any application that uses all leads, and also for use in IBM® compatible parallel applications as an extension cable or in conjunction with our data switches.

16-Conductor Cable

Choose this cable for sync applications where full modem control is required in addition to some secondary tests and secondary modem control leads (Pins 1–8, 15, 17, 20–25).

Item	Code	Price
RS-232 Cables (NEC® CL2)		
12 Conductors; Pinning: Pins 1–8, 15, 17, 20, 22		
2-ft. (0.6-m)	ECM12C-0002	**$14.95**
5-ft. (1.5-m)	ECM12C-0005	**$15.95**
10-ft. (3.0-m)	ECM12C-0010	**$17.95**
15-ft. (4.6-m)	ECM12C-0015	**$19.95**
20-ft. (6.1-m)	ECM12C-0020	**$20.95**
25-ft. (7.6-m)	ECM12C-0025	**$22.95**
35-ft. (10.6-m)	ECM12C-0035	**$25.95**
50-ft. (15.2-m)	ECM12C-0050	**$31.95**
Custom Lengths	ECN12C	**$16.15 + $.37/ft.**
7 Conductors; Pinning: Pins 2–4, 6–8, 20		
2-ft. (0.6-m)	ECM07C-0002	**$13.95**
5-ft. (1.5-m)	ECM07C-0005	**$14.95**
10-ft. (3.0-m)	ECM07C-0010	**$15.95**
15-ft. (4.6-m)	ECM07C-0015	**$16.95**
20-ft. (6.1-m)	ECM07C-0020	**$17.95**
25-ft. (7.6-m)	ECM07C-0025	**$18.95**
35-ft. (10.6-m)	ECM07C-0035	**$20.95**
50-ft. (15.2-m)	ECM07C-0050	**$23.95**
Custom Lengths	ECN07C	**$15.10 + $.23/ft.**

12-Conductor Cable

This basic sync data cable supports all standard modem control leads, plus clocking leads and ring indicate for sync operation (Pins 1–8, 15, 17, 20, 22).

7-Conductor Cable

This cable is typically used in async applications requiring additional modem control leads for hardware handshaking and flow control (Pins 2–4, 6–8, 20).

4-Conductor Cable

This type of cable is used only in async applications where flow control is provided by software (such as X-ON/X-OFF). Standard pin arrangements support your Transmit and Receive data leads, Signal Ground, and Data Terminal Ready (Pins 2, 3, 7, 20).

SPECIFICATIONS

Cable Construction — PVC
Conductor Gauge — 22 AWG (7 x 30)
Mutual Capacitance — 50 pF/ft.
Resistance — <16 ohms/1000 ft.
Shield — None

MORE! RS-232 Cables, **see pp. 84, 86.**

Item	Code	Price
RS-232 Cables (NEC® CL2)		
4 Conductors; Pinning: Pins 2, 3, 7, 20		
2-ft. (0.6-m)	ECM04C-0002	**$11.95**
5-ft. (1.5-m)	ECM04C-0005	**$12.95**
10-ft. (3.0-m)	ECM04C-0010	**$13.95**
15-ft. (4.6-m)	ECM04C-0015	**$14.95**
20-ft. (6.1-m)	ECM04C-0020	**$15.95**
25-ft. (7.6-m)	ECM04C-0025	**$16.95**
35-ft. (10.6-m)	ECM04C-0035	**$17.95**
50-ft. (15.2-m)	ECM04C-0050	**$19.95**
Custom Lengths	ECN04C	**$14.00 + $.16/ft.**

ABSOLUTELY GUARANTEED FOR LIFE

Extended-Distance Data Cables • Extended-Distance/Quiet Cables **STRANDED**

Keep Data Signals Strong over Long Hauls—up to 500 Feet!

- Send data up to 500 feet (152.4 m) and break the 50-foot (15.2-m) RS-232 distance.
- All conductors are straight-wired for connecting the parallel output of your computer to a switch box.
- Male screwlocks are standard.
- Low capacitance.
- NEC® CL2 compliant. Connect computer or telephones for applications inside a building. Not for use in risers or plenums.

SPECIFICATIONS

Cable Construction — PVC
Capacitance — 12 pF/ft. ± 2 pF/ft.
Conductor Gauge — 24 AWG (7 x 32), stranded
Outside Diameters — 0.245", 0.260", 0.335", 0.365", 0.430"
Resistance — 30 ohms/1000 ft.

Shielded, Repinnable

EDN25C

NOTE: Specify gender when ordering.

Item	Code	Price
Extended-Distance Data Cables (NEC® CL2)		
25 Conductors (12½ Pairs)—Pins 1–25		
35-ft. (10.6-m)	EDN25C-0035	**$45.95**
50-ft. (15.2-m)	EDN25C-0050	**$56.95**
75-ft. (22.8-m)	EDN25C-0075	**$74.95**
100-ft. (30.5-m)	EDN25C-0100	**$91.95**
150-ft. (45.7-m)	EDN25C-0150	**$127.95**
200-ft. (60.9-m)	EDN25C-0200	**$163.95**
250-ft. (76.2-m)	EDN25C-0250	**$199.95**
Custom Lengths	EDN25C	**$21.55 + $.76/ft.**

Extra Shielding, Molded Hoods

EMN25C

*NOTE: If your application demands a plenum-rated cable, see our Plenum Cables on **page 122**.*

NOTE: Specify gender when ordering.

Item	Code	Price
ED/Q Cables with Molded Hoods (NEC® CL2)		
25 Conductors (12½ Pairs)—Pins 1–25		
5-ft. (1.5-m)	EMN25C-0005	**$44.95**
10-ft. (3.0-m)	EMN25C-0010	**$49.95**
15-ft. (4.6-m)	EMN25C-0015	**$53.95**
20-ft. (6.1-m)	EMN25C-0020	**$57.95**
25-ft. (7.6-m)	EMN25C-0025	**$62.95**
35-ft. (10.7-m)	EMN25C-0035	**$70.95**
50-ft. (15.2-m)	EMN25C-0050	**$83.95**
75-ft. (22.9-m)	EMN25C-0075	**$105.95**
100-ft. (30.5-m)	EMN25C-0100	**$127.95**
150-ft. (45.7-m)	EMN25C-0150	**$171.95**
200-ft. (61.0-m)	EMN25C-0200	**$214.95**
Custom Lengths	EMN25C	**$45.25 + $.97/ft.**

Extended-Distance Data Cables with Removable Hoods

- Feature an aluminum-foil shield surrounding the conductors for EMI/RFI protection, and drain wire.
- Transmit RS-232 data up to 500 feet (152.4 m) at 9600 bps.
- Removable hoods allow for repinning.

Item	Code	Price
16 Conductors (8 Pairs)—Pins 1–8, 15, 17, 20–25		
35-ft. (10.6-m)	EDN16C-0035	**$35.95**
50-ft. (15.2-m)	EDN16C-0050	**$42.95**
75-ft. (22.8-m)	EDN16C-0075	**$54.95**
100-ft. (30.5-m)	EDN16C-0100	**$66.95**
150-ft. (45.7-m)	EDN16C-0150	**$90.95**
200-ft. (60.9-m)	EDN16C-0200	**$114.95**
250-ft. (76.2-m)	EDN16C-0250	**$139.95**
Custom Lengths	EDN16C	**$20.45 + $.54/ft.**
12 Conductors (6 Pairs)—Pins 1–8, 15, 17, 20, 22		
35-ft. (10.6-m)	EDN12C-0035	**$30.95**
50-ft. (15.2-m)	EDN12C-0050	**$36.95**
75-ft. (22.8-m)	EDN12C-0075	**$46.95**
100-ft. (30.5-m)	EDN12C-0100	**$56.95**
150-ft. (45.7-m)	EDN12C-0150	**$75.95**
200-ft. (60.9-m)	EDN12C-0200	**$94.95**
250-ft. (76.2-m)	EDN12C-0250	**$113.95**
Custom Lengths	EDN12C	**$19.40 + $.44/ft.**

Item	Code	Price
7 Conductors (3½ Pairs)—Pins 2–4, 6–8, 20		
35-ft. (10.6-m)	EDN07C-0035	**$26.95**
50-ft. (15.2-m)	EDN07C-0050	**$30.95**
75-ft. (22.8-m)	EDN07C-0075	**$37.95**
100-ft. (30.5-m)	EDN07C-0100	**$45.95**
150-ft. (45.7-m)	EDN07C-0150	**$59.95**
200-ft. (60.9-m)	EDN07C-0200	**$74.95**
250-ft. (76.2-m)	EDN07C-0250	**$89.95**
Custom Lengths	EDN07C	**$18.30 + $.32/ft.**
4 Conductors (2 Pairs)—Pins 2, 3, 7, 20		
35-ft. (10.6-m)	EDN04C-0035	**$20.95**
50-ft. (15.2-m)	EDN04C-0050	**$23.95**
75-ft. (22.8-m)	EDN04C-0075	**$28.95**
100-ft. (30.5-m)	EDN04C-0100	**$33.95**
150-ft. (45.7-m)	EDN04C-0150	**$43.95**
200-ft. (60.9-m)	EDN04C-0200	**$52.95**
250-ft. (76.2-m)	EDN04C-0250	**$62.95**
Custom Lengths	EDN04C	**$16.15 + $.22/ft.**

Extended-Distance/Quiet (ED/Q) Cables with Molded Hoods

- Feature a foil shield, plus an 85% tinned copper braid for extra protection against EMI/RFI transmissions in noisy office environments.
- Transmit RS-232 data up to 500 feet (152.4 m) at 9600 bps.
- Molded, non-removable hoods.

MORE! RS-232 Cables, **see pp. 86, 121–123.**

Item	Code	Price
16 Conductors (8 Pairs)—Pins 1–8, 15, 17, 20–25		
5-ft. (1.5-m)	EMN16C-0005	**$38.95**
10-ft. (3.0-m)	EMN16C-0010	**$41.95**
15-ft. (4.6-m)	EMN16C-0015	**$45.95**
20-ft. (6.1-m)	EMN16C-0020	**$48.95**
25-ft. (7.6-m)	EMN16C-0025	**$51.95**
35-ft. (10.7-m)	EMN16C-0035	**$57.95**
50-ft. (15.2-m)	EMN16C-0050	**$66.95**
75-ft. (22.9-m)	EMN16C-0075	**$82.95**
100-ft. (30.5-m)	EMN16C-0100	**$98.95**
150-ft. (45.7-m)	EMN16C-0150	**$129.95**
200-ft. (61.0-m)	EMN16C-0200	**$159.95**
Custom Lengths	EMN16C	**$39.85 + $.70/ft.**
12 Conductors (6 Pairs)—Pins 1–8, 15, 17, 20, 22		
5-ft. (1.5-m)	EMN12C-0005	**$34.95**
10-ft. (3.0-m)	EMN12C-0010	**$36.95**
15-ft. (4.6-m)	EMN12C-0015	**$39.95**
20-ft. (6.1-m)	EMN12C-0020	**$42.95**
25-ft. (7.6-m)	EMN12C-0025	**$44.95**
35-ft. (10.7-m)	EMN12C-0035	**$49.95**
50-ft. (15.2-m)	EMN12C-0050	**$58.95**
75-ft. (22.9-m)	EMN12C-0075	**$71.95**
100-ft. (30.5-m)	EMN12C-0100	**$84.95**
150-ft. (45.7-m)	EMN12C-0150	**$111.95**
200-ft. (61.0-m)	EMN12C-0200	**$137.95**
Custom Lengths	EMN12C	**$35.55 + $.59/ft.**

Item	Code	Price
7 Conductors (3½ Pairs)—Pins 2–4, 6–8, 20		
5-ft. (1.5-m)	EMN07C-0005	**$25.95**
10-ft. (3.0-m)	EMN07C-0010	**$27.95**
15-ft. (4.6-m)	EMN07C-0015	**$29.95**
20-ft. (6.1-m)	EMN07C-0020	**$30.95**
25-ft. (7.6-m)	EMN07C-0025	**$32.95**
35-ft. (10.7-m)	EMN07C-0035	**$36.95**
50-ft. (15.2-m)	EMN07C-0050	**$41.95**
75-ft. (22.9-m)	EMN07C-0075	**$50.95**
100-ft. (30.5-m)	EMN07C-0100	**$59.95**
150-ft. (45.7-m)	EMN07C-0150	**$77.95**
200-ft. (61.0-m)	EMN07C-0200	**$95.95**
Custom Lengths	EMN07C	**$26.95 + $.39/ft.**
4 Conductors (2 Pairs)—Pins 2, 3, 7, 20		
5-ft. (1.5-m)	EMN04C-0005	**$23.95**
10-ft. (3.0-m)	EMN04C-0010	**$24.95**
15-ft. (4.6-m)	EMN04C-0015	**$26.95**
20-ft. (6.1-m)	EMN04C-0020	**$27.95**
25-ft. (7.6-m)	EMN04C-0025	**$29.95**
35-ft. (10.7-m)	EMN04C-0035	**$31.95**
50-ft. (15.2-m)	EMN04C-0050	**$36.95**
75-ft. (22.9-m)	EMN04C-0075	**$43.95**
100-ft. (30.5-m)	EMN04C-0100	**$50.95**
150-ft. (45.7-m)	EMN04C-0150	**$65.95**
200-ft. (61.0-m)	EMN04C-0200	**$79.95**
Custom Lengths	EMN04C	**$24.80 + $.32/ft.**

BLACK BOX Catalog
FALL/WINTER 1997 • 1998
The World's Source for
Your Global Super Highway
Over
150,000
Custom Cables
Produced Each
Year!

Guess Who Called Black Box for Custom Cables?

Need Custom Cable? No Problem.

The old cable failed. No one carries it anymore. And you *have* to get that equipment up and running.

Don't worry. You found *the* only source you need for custom cable—Black Box.

You see, our specialty is custom cables. In fact, Black Box has designed and built over 150,000 custom cables in a single year. That's a lot of cables—and a lot of cable-making experience.

Just pick up the phone and you're on your way to getting exactly what you need. No problem. No hassle.

We Make One-of-a-Kinds Every Day.

RS-232. Video. DB. SCSI. We build custom cables every day. So when it comes to unusual or innovative combinations, Black Box has the resources right here in Lawrence, PA, to design and build your cable—even if it's never been done before. Our engineers enjoy challenges.

More Custom RS-232 Cables than Anyone Else.

Ever try to find a replacement cable for your vintage equipment? It's not so easy—unless you call Black Box. We build more custom RS-232 cable than any other datacomm outfit in the world. Because we know how to do it right.

Need special connectors or pinning? No problem. Send us the old cable. We'll replicate it. Problem solved.

Get Your Cable FAST!

You'll most likely have your custom cable in your hands in a few days. We ship most of our custom cables within 2–3 days of receiving your order. That's *FAST*. Compare that to a week or two—if you can find someone else to even make the cable.

Top Quality at the Right Price.

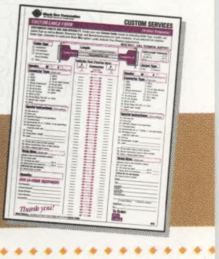
You'll get the same top quality as our stock cables. We test and certify every cable we make. And you won't break your budget either. Black Box custom cables are reasonably priced, because we do it every day.

Variety. Innovation. Speed. Quality.

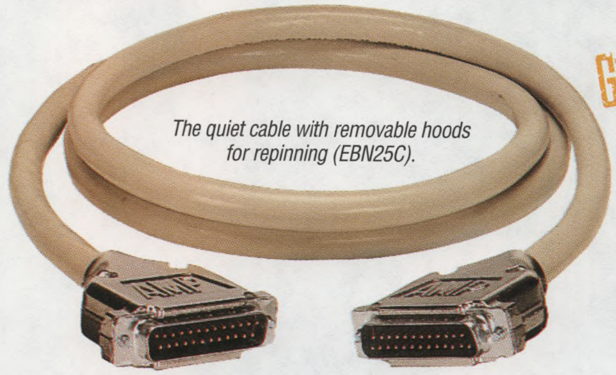
That's why more datacomm professionals rely on Black Box for custom cable than any other manufacturer.

And our customers tell us Black Box makes ordering custom cables a hassle-free experience.

To order your Custom Cable, call 412-746-5500. Or look for the Custom Cable Form between pages 66 and 67 of this Catalog.



Maximum Protection for Short RS-232 Runs in Noisy Environments.



The quiet cable with removable hoods for repinning (EBN25C).

The quiet cable with thumbscrew convenience (EGM25C).

Extended Distance/Quiet Cables

- **Made for the short run—up to 50 feet (15.2 m)—in extra noisy environments.**
- **Use for long runs—up to 500 feet (152.4 m) at 9600 baud—in extra quiet environments.**
- **Ideal for industrial environments. EMI/RFI-resistant hoods stop damaging noise where cables are most vulnerable—at the connection.**
- **Protect your data from end to end with a 100% foil shield plus an 85% tinned copper braided shield.**

Noise bursts can come from just about anywhere—fluorescent lighting, radio or cellular transmitters, electrical wiring, and other data cables. Electrical energy from any one of them can scramble your data.

If you have long cable runs in noisy areas, you need the cable that ensures every bit of your document will be accounted for when it arrives at the printer, the modem, or your PC. You need BLACK BOX® ED/Q Cable.

SPECIFICATIONS

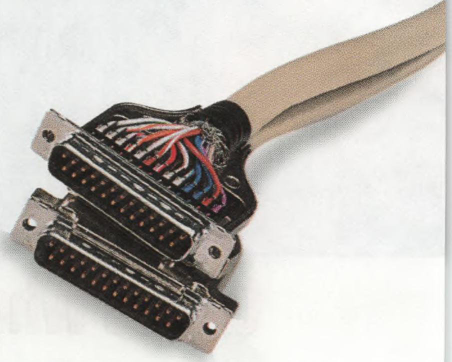
Cable Construction — PVC
Conductor Gauge — 24 AWG (7 x 32) stranded copper
Mutual Capacitance — Removable Hoods: 12 pF/ft.; Thumbscrew Hoods: 13.3 pF/ft.
Resistance — 30 ohms/1000 ft.
Shield — 100% aluminum foil, 85% tinned copper braid

ED/Q Cables with Die-Cast Removable Metallic EMI/RFI Hoods

- Our high-quality ED/Q Cable with Die-Cast Removable Metallic EMI/RFI Hoods gives you extra protection at the ends of the cable.
- Remove the hoods for convenient testing or repinning.

ED/Q Thumbscrew Cables with Nonremovable EMI/RFI Hoods

- Protect your data with our high-quality noise-resistant, ED/Q Cable and EMI/RFI Hoods.
- Convenient thumbscrews ensure tight, solid connections. No more twisting screwdrivers. These cables are built for quick connect/disconnect.



Removable metal hoods on the EBN04C—EBN25C cables for convenient testing or repinning.

NOTE: Specify gender (MM, MF, or FF) and length when ordering.

Item	Code	Price
ED/Q Cables with Die-Cast Removable EMI/RFI Hoods (DB25, NEC® CL2)		
25 (12½ Pairs)—Pins 1–25		
5-ft. (1.5-m)	EBN25C-0005	**$32.95**
10-ft. (3.0-m)	EBN25C-0010	**$37.95**
20-ft. (6.1-m)	EBN25C-0020	**$45.95**
25-ft. (7.6-m)	EBN25C-0025	**$50.95**
50-ft. (15.2-m)	EBN25C-0050	**$72.95**
Custom Lengths	EBN25C	**$32.30 + $.97/ft.**
16 (8 Pairs)—Pins 1–8, 15, 17, 20–25		
5-ft. (1.5-m)	EBN16C-0005	**$26.95**
10-ft. (3.0-m)	EBN16C-0010	**$29.95**
20-ft. (6.1-m)	EBN16C-0020	**$36.95**
25-ft. (7.6-m)	EBN16C-0025	**$39.95**
50-ft. (15.2-m)	EBN16C-0050	**$55.95**
Custom Lengths	EBN16C	**$26.95 + $.70/ft.**
12 (6 Pairs)—Pins 1–8, 15, 17, 20, 22		
5-ft. (1.5-m)	EBN12C-0005	**$25.95**
10-ft. (3.0-m)	EBN12C-0010	**$28.95**
20-ft. (6.1-m)	EBN12C-0020	**$33.95**
25-ft. (7.6-m)	EBN12C-0025	**$36.95**
50-ft. (15.2-m)	EBN12C-0050	**$49.95**
Custom Lengths	EBN12C	**$25.85 + $.59/ft.**

Item	Code	Price
ED/Q Cables with Die-Cast Removable EMI/RFI Hoods (DB25, NEC® CL2)		
7 (3½ Pairs)—Pins 2–4, 6–8, 20		
5-ft. (1.5-m)	EBN07C-0005	**$21.95**
10-ft. (3.0-m)	EBN07C-0010	**$23.95**
20-ft. (6.1-m)	EBN07C-0020	**$27.95**
25-ft. (7.6-m)	EBN07C-0025	**$28.95**
50-ft. (15.2-m)	EBN07C-0050	**$37.95**
Custom Lengths	EBN07C	**$22.65 + $.39/ft.**
4 (2 Pairs)—Pins 2, 3, 7, 20		
5-ft. (1.5-m)	EBN04C-0005	**$20.95**
10-ft. (3.0-m)	EBN04C-0010	**$21.95**
20-ft. (6.1-m)	EBN04C-0020	**$24.95**
25-ft. (7.6-m)	EBN04C-0025	**$26.95**
50-ft. (15.2-m)	EBN04C-0050	**$33.95**
Custom Lengths	EBN04C	**$21.55 + $.32/ft.**

Item	Code	Price
ED/Q Thumbscrew Cables with Nonremovable EMI/RFI Hoods (DB25, NEC® CL2)		
25 (12½ Pairs)—Pins 1–25		
2-ft. (0.6-m)	EGM25C-0002	**$29.00**
5-ft. (1.5-m)	EGM25C-0005	**$31.00**
10-ft. (3.0-m)	EGM25C-0010	**$36.00**
15-ft. (4.6-m)	EGM25C-0015	**$41.00**
20-ft. (6.1-m)	EGM25C-0020	**$46.00**
25-ft. (7.6-m)	EGM25C-0025	**$49.00**
35-ft. (10.7-m)	EGM25C-0035	**$56.00**
50-ft. (15.2-m)	EGM25C-0050	**$68.00**
Custom Lengths	EGM25C	**$38.25 + $1.25/ft.**
ED/Q Thumbscrew Cables with Nonremovable EMI/RFI Hoods (DB9, NEC® CL2)		
9 (4½ Pairs)—All Pins		
2-ft. (0.6-m)	EGM12D-0002	**$18.30**
5-ft. (1.5-m)	EGM12D-0005	**$19.85**
10-ft. (3.0-m)	EGM12D-0010	**$22.45**
20-ft. (6.1-m)	EGM12D-0020	**$27.75**
25-ft. (7.6-m)	EGM12D-0025	**$30.25**
35-ft. (10.7-m)	EGM12D-0035	**$35.50**
50-ft. (15.2-m)	EGM12D-0050	**$44.00**
Custom Lengths	EGM12D	**$26.95 + $.76/ft.**

PLUS! Need Custom Cables? See the Custom Cable Form **(between pp. 66 and 67).**

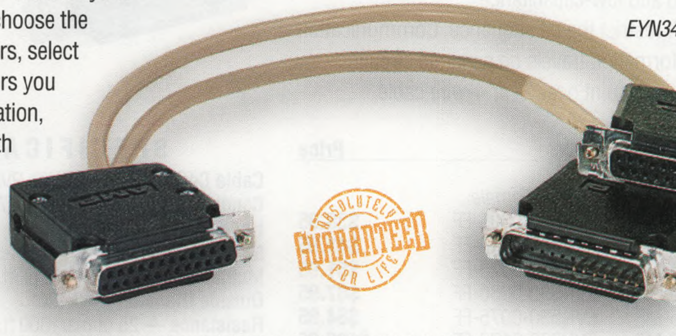
Y Cable

Use One RS-232 Port to Send Data to Two Devices Simultaneously.

- **Connect one PC to two serial printers, or…**
- **Connect one modem to two terminals, or…**
- **Connect three different devices, like a security card reader to a terminal and a printer.**
- **Ideal for simple applications where you need to share data with another user or device.**

The BLACK BOX® Y Cable is the simplest solution for sending your data to two places at one time.

We'll build your Y Cable to your specifications. You choose the number of conductors, select the connector genders you need for your application, and specify the length of each branch.



EYN340

ABSOLUTELY GUARANTEED FOR LIFE

NOTE: When ordering, please specify:

- *the number of conductors*
- *the gender of each connector*
- *the length of each leg of the "Y"*

Call us for any configurations we haven't mentioned here.

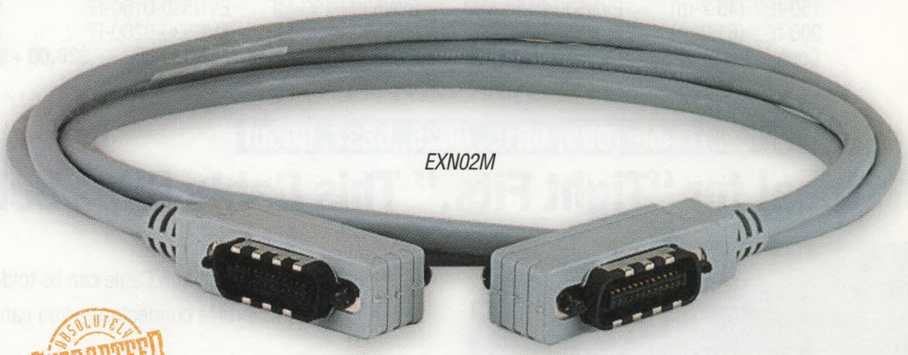
Item	Code	Price
Y Cable		
7-Conductor Round Cable (Pins 1–7)		
Custom Lengths	EYN340	**$26.95 + $.31/ft.**
12-Conductor Round Cable (Pins 1–8, 15, 17, 20, and 22)		
Custom Lengths	EYN350	**$26.95 + $.47/ft.**
25-Conductor Ribbon Cable (Pins 1–25)		
Custom Lengths	EY235	**$31.95 + $.62/ft.**

* * *

IEEE-488 Cable

Shielded 488 Cable that's 100% Compatible with Your Shop or Lab Systems.

- **PVC insulation gives your cable flexibility—and a longer life.**
- **Male *and* female contacts prevent cable mismatches and enable daisychaining.**



EXN02M

ABSOLUTELY GUARANTEED FOR LIFE

Interconnect up to 15 programmable instruments in star or daisychain networks with high-quality BLACK BOX® IEEE-488 Cable.

Our IEEE-488 Cable is compatible with all devices equipped with the standard IEEE-488 interface. It's UL® recognized with molded connectors made of self-extinguishing plastic and gold over nickel-plated beryllium copper contact pins to withstand make/break cycling.

PVC insulation protects conductors from flexing damage, and durable tinned copper-braid shields help guard against electrical interference.

Connectors have both male and female contacts to prevent cable mismatches and to enable daisychaining.

PLUS! 232↔488 Interface Converter, **see p. 334.**

PLUS! IEEE-488 Switches, **see p. 245.**

Item	Code	Price
IEEE-488 Cable (with Molded Connectors)		
(HP Part #9643M)		
6.6-ft. (2-m)	EXN02M	**$69.95**
(HP Part #9644M)		
13.1-ft. (4-m)	EXN04M	**$79.95**

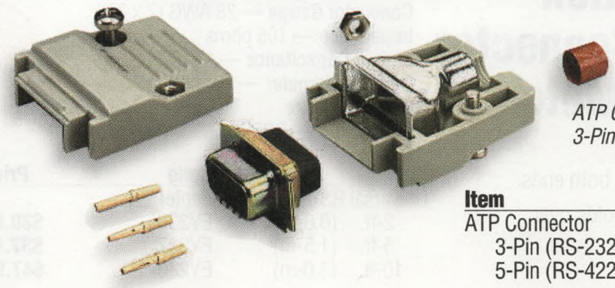
* * *

ATP Connectors

For HP Users—a Complete Cable-Termination Kit.

- **Complete HP connectivity.**
- **Comes with all the parts you need.**
- **RS-232 and RS-422 models.**

Your one source for HP® equipment and AT® connectors, from the hood, shell, screws, and pins to the shielding cans. Choose from RS-232 3-pin or RS-422 5-pin models.

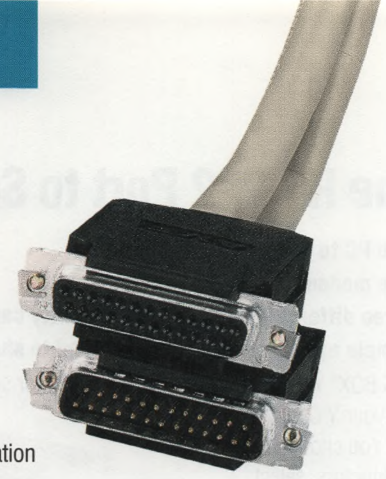


ATP Connector Kit—3-Pin Female (FJ053)

Item	Male	Female	Price
ATP Connector			
3-Pin (RS-232)	FJ054	FJ053	**$11.95**
5-Pin (RS-422)	FJ056	FJ055	**$11.95**

RS-530 Data Cable

Running a High-Speed Bridge or Router? This Cable Is Made for It.



- **Foil shielding protects data from outside interference.**
- **Works with balanced or unbalanced circuits.**

Take full advantage of the high-speed RS-530 port on your bridge or router. To ensure high performance, our RS-530 cable is precision-manufactured and low-capacitance.

In RS-530, the DTE serializes data bits, and the DCE doesn't restrict the bit sequence. Communication is binary, serial, and synchronous or asynchronous. Control information travels on separate circuits. You can send data at half- or full-duplex, and point-to-point or multipoint over 2- or 4-wire cable.

Item	Code	Code	Code	Price
RS-530 Data Cable 25-Pin (12½ pairs), Pinning 1–25				
	Male/Male	*Male/Female*	*Female/Female*	
5-ft. (1.5-m)	EVN530-0005-MM	EVN530-0005-MF	EVN530-0005-FF	**$38.95**
10-ft. (3.0-m)	EVN530-0010-MM	EVN530-0010-MF	EVN530-0010-FF	**$41.95**
25-ft. (7.6-m)	EVN530-0025-MM	EVN530-0025-MF	EVN530-0025-FF	**$51.95**
50-ft. (15.2-m)	EVN530-0050-MM	EVN530-0050-MF	EVN530-0050-FF	**$67.95**
75-ft. (22.8-m)	EVN530-0075-MM	EVN530-0075-MF	EVN530-0075-FF	**$84.95**
100-ft. (30.5-m)	EVN530-0100-MM	EVN530-0100-MF	EVN530-0100-FF	**$102.95**
150-ft. (45.7-m)	EVN530-0150-MM	EVN530-0150-MF	EVN530-0150-FF	**$133.95**
200-ft. (61.0-m)	EVN530-0200-MM	EVN530-0200-MF	EVN530-0200-FF	**$169.95**
Custom Lengths	EVN530-MM	EVN530-MF	EVN530-FF	**$28.00 + $1.03/ft.**

SPECIFICATIONS

Cable Construction — Beige PVC
Conductor Gauge — 24 AWG (7 x 32 AWG)
Hoods — Black plastic
Maximum Distance — Per RS-530 specifications
Mutual Capacitance — 12 pF/ft.
Outside Diameter — 0.430"
Resistance — 25 ohms/1000 ft.
Shield — Foil with a drain wire
Connectors — DB25 (specify male or female)

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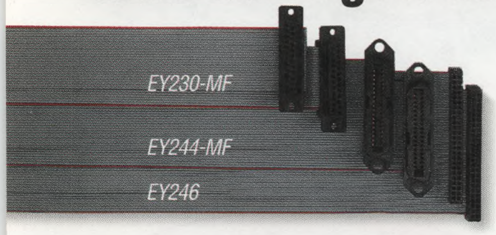
Flat (Ribbon) Cable (DB9, DB15, DB25, DB37, DB50)

Ideal for "Tight Fits," This Cable Slips behind Desks and Cubicles.



- This wafer-thin Ribbon Cable can be folded and tucked inside your PC in tight quarters.
- Special low-profile connectors—you can fit your devices snugly against any wall.

NOTE: Remember to specify your cable length when ordering (use for short distances only).

Item	Code	Code	Code	Price
Flat (Ribbon) Cable				
Connectors	*Male/Male*	*Male/Female*	*Female/Female*	
DB9	EY240-MM	EY240-MF	EY240-FF	**$17.95 + $.26/ft.**
DB15	EY241-MM	EY241-MF	EY241-FF	**$19.95 + $.38/ft.**
DB25	EY230-MM	EY230-MF	EY230-FF	**$20.95 + $.60/ft.**
DB37	EY242-MM	EY242-MF	EY242-FF	**$26.95 + $1.08/ft.**
DB50	EY248-MM	EY248-MF	EY248-FF	**$43.95 + $1.23/ft.**
36-Pin (for Centronics®)	EY244-MM	EY244-MF	EY244-FF	**$26.95 + $1.08/ft.**
50-Pin telco	EY245-MM	EY245-MF	EY245-FF	**$34.95 + $1.23/ft.**
50-Pin Berg			EY246	**$15.10 + $1.23/ft.**

SPECIFICATIONS

Cable Construction — Gray PVC
Conductor Gauge — 28 AWG (7 x 36)
Mutual Capacitance — 14 pF/ft.
Shield — None

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Universal RS-232 Cable Adapter

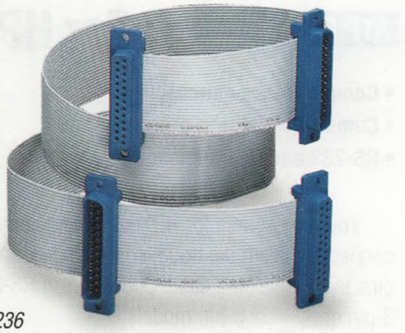
The Quick Solution When RS-232 Connector Genders Don't Match.

SPECIFICATIONS

Cable Construction — Gray PVC
Conductor Gauge — 28 AWG (7 x 36)
Impedance — 105 ohms
Mutual Capacitance — 14 pF/ft.
Outside Diameter — Flat ribbon
Shield — None
Connectors — DB25

- Male and female connectors on both ends.
- Compact RS-232 ribbon cable folds over on itself to tuck into tight spaces.

Item	Code	Price
Universal RS-232 Cable Adapter		
2-ft. (0.6-m)	EY236	**$30.95**
5-ft. (1.5-m)	EY237	**$37.95**
10-ft. (3.0-m)	EY238	**$47.95**



EY236

Black Box Explains...

V.35—The Faster Serial Interface.

V.35 is the ITU (formerly CCITT) standard termed "Data Transmission at 48 Kbps Using 60–108 KHz Group-Band Circuits."

Basically, V.35 is a high-speed serial interface designed to support both higher data rates and connectivity between DTEs (data-terminal equipment) or DCEs (data-communication equipment) over digital lines.

Recognizable by its blocky, 34-pin connector, V.35 combines the bandwidth of several telephone circuits to provide the high-speed interface between a DTE or DCE and a CSU/DSU (Channel Service Unit/Data Service Unit).

Although it's commonly used to support speeds ranging anywhere from 48 to 64 Kbps, much higher rates are possible. For instance, maximum V.35 cable distances theoretically can range up to 4000 feet (1200 m) at speeds up to 100 Kbps. Actual distances will depend on your equipment and cable.

To achieve such high speeds and great distances, V.35 combines both balanced and unbalanced voltage signals on the same interface. For an illustration of the V.35 interface and pinning, turn to **page 623**.

V.35 Cable • M/50 Connector Cable

You've Found Your Source for V.35 and M/50 Cable.

EYN450

ABSOLUTELY GUARANTEED FOR LIFE

- **V.35 cables with straight-through or crossover (tail-circuit) pinning.**
- **M/50 cables pinned straight through for Dataproducts® printer applications.**

Use V.35 Interface Cable between two devices (such as a modem and a mux with V.35 connectors) for high-speed data transmissions. All 34 pins are connected straight through.

V.35 Tail Circuit Cable has cross-pinning which makes it ideal for tail-circuit applications. See the pinning chart on **page 111**.

Use M/50 Connector Cable for Dataproducts printer applications. The pinning is straight through. M/50 Cable is not for V.35 applications.

EYN500

SPECIFICATIONS

Cable Construction — Beige PVC
Conductor Gauge — 24 AWG (7 x 32)
Hoods — EYN450, EYN452: M-block (EMI/RFI); EYN500: EMI/RFI metal
Maximum Distance — As per equipment specifications
Mutual Capacitance — EYN450, EYN452: 12 pF/ft.; EYN500: 30 pF/ft.
Outside Diameter — EYN450: 0.515"; EYN452: 0.335"; EYN500: 0.490"
Resistance — 25 ohms/1000 ft.
Shield — Foil with a drain wire
Connectors — EYN450, EYN452: V.35, male or female; EYN500: M/50, male or female

Item		Code	Code	Code	Price
V.35 Interface Cable (34-Conductor)					
		Male/Male	*Male/Female*	*Female/Female*	
3-ft.	(0.9-m)	EYN450-0003-MM	EYN450-0003-MF	EYN450-0003-FF	**$73.95**
6-ft.	(1.8-m)	EYN450-0006-MM	EYN450-0006-MF	EYN450-0006-FF	**$77.95**
10-ft.	(3.0-m)	EYN450-0010-MM	EYN450-0010-MF	EYN450-0010-FF	**$83.95**
20-ft.	(6.1-m)	EYN450-0020-MM	EYN450-0020-MF	EYN450-0020-FF	**$96.95**
25-ft.	(7.6-m)	EYN450-0025-MM	EYN450-0025-MF	EYN450-0025-FF	**$103.95**
Custom Lengths		EYN450-MM	EYN450-MF	EYN450-FF	**$75.35 + $1.13/ft.**
V.35 Tail-Circuit Cable (See Pinning Chart on **page 111**)					
		Male/Male	*Male/Female*	*Female/Female*	
Custom Lengths		EYN452-MM	EYN452-MF	EYN452-FF	**$53.95 + $.57/ft.**
M/50 Connector Cable (Not for V.35 Applications)					
		Male/Male	*Male/Female*	*Female/Female*	
Custom Lengths		EYN500-MM	EYN500-MF	EYN500-FF	**$79.95 + $1.35/ft.**

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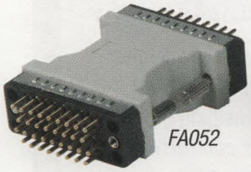
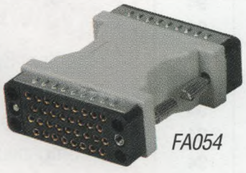
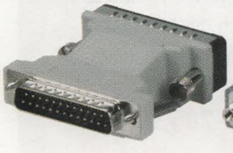
V.35 Gender Changers



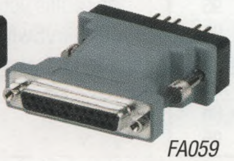
FA052



FA054



FA058



FA059

V.35 Gender Changers Have Arrived! Get Them First at Black Box.

New

- **Molded construction for durability.**
- **Protect ports from overuse and damage.**
- **Match V.35 to V.35 or to RS-232 (DB25).**

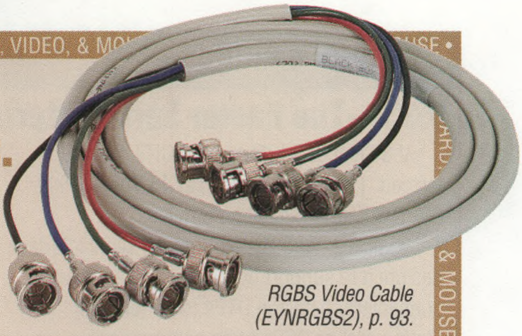
MORE! Adapters, see pp. 129–131.

Techs: The adapters you've been asking for are here. With these new V.35 Gender Changers you can make immediate connector matches. No more ordering custom cables! Now there's an easy solution when you need to connect routers or CSU/DSUs and have the wrong gender. Just ask for V.35 Gender Changers—new from Black Box.

Item	Code	Price
V.35 Gender Changers		
V.35 to V.35		
Male/Male	FA052	**$39.95**
Female/Female	FA054	**$43.95**
V.35 to RS-232 (DB25)		
Female/Male	FA058	**$19.95**
Male/Female	FA059	**$19.95**

Extend Your Computer's Capabilities with These Keyboard, Video, & Mouse Cables.

- Video: Link monitors to CPUs up to 100 feet away.
- Keyboard and Mouse: Connect to CPUs up to 25 feet away.
- TV, VCR, Stereo, and Audio: Gold-plated connectors give superior performance.



RGBS Video Cable (EYNRGBS2), p. 93.

VIDEO CABLES

Item	Connector 1	Connector 2	Length	Code	Page
VGA Video Extension Cable	HD15 Male or Female	HD15 Male or Female	3', 5', 10', 20', 25', 35', 50', 75', 100', Custom	EVNPS05	**91**
VGA to RGBS Cable	HD15 Female	(5) BNC Coax	6'	EYRGBS4	**91**
Video EGA Cable	DB9 Male or Female*	DB9 Male or Female*	2', 5', 10', 20', 25', 50', 100', Custom*	EHM005	**91**
RGBS Video Cable	(4) BNC Male or Female	(4) BNC Male or Female	5', 10', 25', 50'	EYNRGBS2	**93**
Sun® Video Cable 13C3	13C3 Male or Female	13C3 Male or Female	6', 10', 25', 50', Custom	EVMVDT02	**93**
Mac® DB15 to 4 Coax	DB15 Male	(4) BNC Coax	6'	EYRGBS3	**93**
Mac Video Cable	DB15 Male	DB15 Male	6' 12'	EVMA14 EVMA15	**112**
Mac Video Extension Cable	DB15 Male	DB15 Female	6'	EVMA16	**112**
Mac Video Cable	DB15 Male	(3) BNC	6'	EVMA13	**112**

*Female/Female connections only available as a custom cable.

KEYBOARD AND MOUSE CABLES

Item	Standard	Connector 1	Connector 2	Length	Code	Page
Mouse Extension Cable	AT®	DB9 Male	DB9 Female	6'	BC00200	**92**
Mouse Extension or Replacement Cable	PS/2®	6-pin mini DIN Male or Female*	6-pin mini DIN Male or Female*	3', 6', 10', 20', Custom	EVMPS03	**92**
Keyboard Extension or Replacement Cable	AT	5-pin DIN Male or Female*	5-pin DIN Male or Female*	6', 10', 20', 25', Custom	EVMBDC	**92**
Keyboard Replacement Cable	PS/2	6-pin mini DIN Male	SDL Male	Custom up to 25'	EVNPS02	**92**
Keyboard Extension Cable	Mac	4-pin mini DIN Male	4-pin mini DIN Male	6', 10'	EVMK4B	**112**
ADB Port Extension Cable	Mac	4-pin mini DIN Male	4-pin mini DIN Female	6'	EVMA18	**112**

*Female/Female connections only available as a custom cable.

TV, VCR, STEREO, AND AUDIO CABLES

Item	Type	Length	Code	Page
TV/VCR Connection Cable	Screw-on	3', 6', 12', 25'	EJ200, EJ202	**94**
	Slip-on	3', 6', 12', 25'	EJ202	**94**
Video Plugs/Coupler	F-59		FA854, FA855	**94**
Video Connectors	UHF/VHF		FA860A, FA861A	**94**
	Right-Angle Slip-On		FA865	**94**
	Video Adapter		FA857A	**94**
	Signal Combiner		FA858A	**94**
	Video Balun		FA859A	**94**
Shielded Y Cord	Audio Cable	4"	EJ400, EJ401, EJ402	**95**
Stereo Connection Cable	RCA plugs		EJ100	**95**
Deluxe Stereo Connection Cable	Right-angle RCA plug		EJ500	
Speaker Wire	16- or 18-gauge	25', 50', 100'	EJ505	**95**
Stereo Headphone Extension	Stereo plug/jack	10'	EJ501	**95**
CD-ROM Audio Cables	CD-ROM port to sound card		EN001–EN006	**95**

Yes—We Have ServSwitch Cables!

The Serv Series Switches, our most popular KVM switches, are helping growing companies *control* their computer networks. To find all the cables you need to make your ServSwitch connections, **just turn to pages 284–285.**

VGA Video Extension Cable

Move Your VGA Monitor up to 100 Feet (30.5 m) from Your CPU.

- **Compatible with all VGA computers.**
- **Connect your monitors to splitters for professional PC-based presentations.**
- **Run multiple CPUs from one monitor by linking them to a switch.**

Great Price!

EVNPS05

Pins 9 and 15 have been removed for compatibility with all VGA computers.

Connect a remote monitor to a network server, give video presentations, or protect your CPU by moving it to a safe place. With BLACK BOX® VGA Video Extension Cable, you can put your monitor where you need it—up to 100 feet (30.5 m) away—and maintain the connection with your monitor, keyboard, and mouse.

Improve your professional image and turn PC-based presentations into compelling video productions by using the VGA Video Extension Cable to connect several monitors to a BLACK BOX® VGA Video Splitter (**pages 224 and 226**). And with an Extender, your monitor can be up to 700 feet (213.4 m) from your CPU.

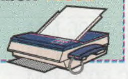
Our versatile VGA Video Extension Cable can also connect your monitor and several CPUs to a keyboard/video switch, giving you convenient control over a network or other large system.

PLUS! Video Splitters and Extenders, **see pp. 224–229.**

PLUS! ServSwitch Cables, **see pp. 284–285.**

Item	**Code**	**Code**	**Code**	**Price**
VGA Video Extension Cable				
	Female/Female	*Male/Female*	*Male/Male*	
3-ft. (0.9-m)	EVNPS05-0003-FF	EVNPS05-0003-MF	EVNPS05-0003-MM	**$27.95**
5-ft. (1.5-m)	EVNPS05-0005-FF	EVNPS05-0005-MF	EVNPS05-0005-MM	**$29.95**
10-ft. (3.0-m)	EVNPS05-0010-FF	EVNPS05-0010-MF	EVNPS05-0010-MM	**$34.95**
20-ft. (6.1-m)	EVNPS05-0020-FF	EVNPS05-0020-MF	EVNPS05-0020-MM	**$41.95**
25-ft. (7.6-m)	EVNPS05-0025-FF	EVNPS05-0025-MF	EVNPS05-0025-MM	**$44.95**
50-ft. (15.2-m)	EVNPS05-0050-FF	EVNPS05-0050-MF	EVNPS05-0050-MM	**$99.95**
75-ft. (22.9-m)	EVNPS05-0075-FF	EVNPS05-0075-MF	EVNPS05-0075-MM	**$124.95**
100-ft. (30.5-m)	EVNPS05-0100-FF	EVNPS05-0100-MF	EVNPS05-0100-MM	**$149.95**
150-ft. (45.7-m)		EVNPS05-0150		**$199.95**
200-ft. (61.0-m)		EVNPS05-0200		**$249.95**
300-ft. (91.5-m)		EVNPS05-0300		**$349.95**
400-ft. (122.0-m)		EVNPS05-0400		**$449.95**
500-ft. (152.5-m)		EVNPS05-0500		**$549.95**
Custom Lengths	EVNPS05-FF	EVNPS05-MF	EVNPS05-MM	**$27.95 + $1.62/ft.**

FAXBACK INFO
Request Document Number: **12032**
Call 412-746-5500
Anytime



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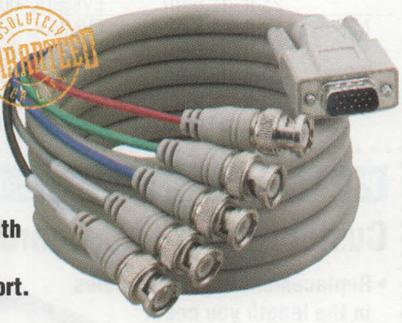
VGA to RGBS Cable

VGA Connectivity.

- **Use it to attach a monitor with red, green, blue, sync, and horizontal inputs to a VGA port.**



EYRGBS4—Shown with DB15 (HD) & (5) BNC coax connectors

Connect a high-definition graphics monitor to your CPU—and do it for a lot less than you'd spend on cable anywhere else.

With BLACK BOX® VGA to RGBS Cable, you get a high-quality cable for your high-resolution workstation. This Cable is specially designed to match RGBS impedance standards. It has molded BNC leads for strain relief, plus woven shielding to block EMI/RFI interference. That means you get clear, noise-free video. And it's color-coded for easy identification.

So don't sacrifice quality. Our high-resolution cables ensure clean video transmissions.

Item		**Code**	**Price**
VGA to RGBS Cable	6-ft. (1.8-m)	EYRGBS4-0006	**$49.95**

Video EGA Cable

EGA Connectivity.

EHM005

- **PVC or plenum available.**
- **Six pairs of 24 AWG wires.**
- **EGA or CGA video extensions.**

For EGA, CGA, and monochrome video systems that use DB9 interface cables, the Video EGA Cable is truly the cable of choice.

Choose the PVC MM or MF gender versions in lengths up to 100 feet. Custom-length FF, MM, and MF versions are also available in PVC or Plenum.

NOTE: Not recommended for use with the IBM® AT.®

Item			**Code**	**Price**
Video EGA Cable—DB9 (CL2)				
PVC	2-ft.	(0.6-m)	EHM005-0002	**$22.95**
	5-ft.	(1.5-m)	EHM005-0005	**$24.95**
	10-ft.	(3.0-m)	EHM005-0010	**$27.95**
	20-ft.	(6.1-m)	EHM005-0020	**$32.95**
	25-ft.	(7.6-m)	EHM005-0025	**$35.95**
	50-ft.	(15.2-m)	EHM005-0050	**$48.95**
	100-ft.	(30.5-m)	EHM005-0100	**$74.95**
	Custom Lengths		EHM005, MM, -MF, or -FF	**$24.95 + $.57/ft.**
Plenum	Custom Lengths		EHM006, MM, -MF, or -FF	**$24.95 + $1.58/ft.**

Please specify connector gender and cable length when ordering.

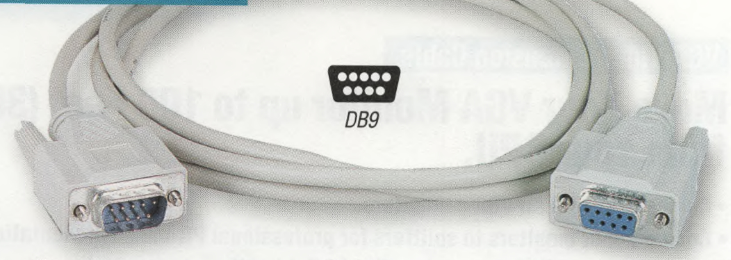
DB9 M/F Cable/Serial Mouse Extension Cable

Extend Your AT Style Mouse Cable.

- **Extend the cable on your AT style mouse.**
- **Or, extend the cable on your EGA/CGA monitor.**

All nine pins on this DB9 Cable are wired straight through. Use it as either an AT® mouse extension cable or an EGA/CGA monitor extension cable. The Cable is 26 AWG and is Mylar® shielded with molded ends and thumbscrews.

NOTE: For longer lengths, call Technical Support.



Item	Code	Price
DB9 M/F Cable/Serial Mouse Extension Cable, 6-ft. (1.8-m)	BC00200	$15.95

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Extend Your PS/2 or AT Keyboard or Mouse Cable.

6-Pin Mini DIN Cable

6-pin Mini DIN

EVMPS03
ABSOLUTELY GUARANTEED FOR LIFE

- **Connect a computer to a KVM switch.**
- **Preferred for IBM® PS/2 connections.**

If you need to extend your keyboard or mouse cable short distances, or if you are connecting your computer to a KVM switch, BLACK BOX® 6-Pin Mini DIN Cable is the logical choice.

The 6-Pin Mini DIN is the preferred cable for connecting a PS/2® CPU to a KVM switch. It has two 6-pin Mini DIN connectors available in MM and MF gender versions.

Choose cable lengths ranging from 3 to 20 feet (0.9 to 6.1 m). We can even custom-cut the 6-Pin Mini DIN Cable to suit your needs.

Item		Code	Price
6-Pin Mini DIN Cable (CL2)			
M/M	3-ft. (0.9-m)	EVMPS03-0003-MM	$22.95
	6-ft. (1.8-m)	EVMPS03-0006-MM	$23.95
	10-ft. (3.0-m)	EVMPS03-0010-MM	$25.95
	20-ft. (6.1-m)	EVMPS03-0020-MM	$29.95
M/F	3-ft. (0.9-m)	EVMPS03-0003-MF	$22.95
	6-ft. (1.8-m)	EVMPS03-0006-MF	$23.95
	10-ft. (3.0-m)	EVMPS03-0010-MF	$25.95
	20-ft. (6.1-m)	EVMPS03-0020-MF	$29.95
	Custom Lengths	EVMPS03-MM, -MF, or -FF	$24.95 + $0.27/ft.

5-Pin DIN Cable (CL2)

5-pin DIN

EVMBDC
ABSOLUTELY GUARANTEED FOR LIFE

- **Maximum length of 25 feet (7.6 m). For greater distance, use the KVM Extender/Sharer for VGA (AC230A), shown on page 229.**
- **AT style for keyboard.**
- **Molded hoods.**

PLUS! KVM Extender/Sharer, **see p. 229.**

The 5-Pin DIN Cable can be used as an AT® keyboard's extension or replacement cable, or it can be used to connect the keyboard to a KVM switch.

Choose cable lengths ranging from 6 to 25 feet (1.8 to 7.6 m).

Item		Code	Price
5-Pin DIN Cable (CL2)			
M/M	6-ft. (1.8-m)	EVMBDC-0006-MM	$14.95
	10-ft. (3.0-m)	EVMBDC-0010-MM	$15.95
	20-ft. (6.1-m)	EVMBDC-0020-MM	$18.95
	25-ft. (7.6-m)	EVMBDC-0025-MM	$21.95
M/F	6-ft. (1.8-m)	EVMBDC-0006-MF	$14.95
	10-ft. (3.0-m)	EVMBDC-0010-MF	$15.95
	20-ft. (6.1-m)	EVMBDC-0020-MF	$18.95
	25-ft. (7.6-m)	EVMBDC-0025-MF	$21.95
	Custom Lengths	EVMBDC-MM,-MF, or -FF	$14.95 + $0.37/ft.

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IBM PC Keyboard Adapters

Get Plugged In and Adapt.

- **The simple solution for incompatible connectors.**
- **Use a full-size keyboard with your notebook computer.**

There are hundreds of keyboards you can choose from—you don't have to settle for the one that comes with your machine. With these Keyboard Adapters, you can hook up your favorite keyboard and any IBM PC.

Use the FA211 to connect an AT keyboard to an IBM PS/2.

Use the FA212 to connect a PS/2 Keyboard to an IBM AT.

5-Pin DIN

6-Pin Mini DIN

Item	Code	Price
IBM PC Keyboard Adapters		
5-Pin DIN Female to 6-Pin Mini DIN Male	FA211	$5.95
6-Pin Mini DIN Female to 5-Pin DIN Male	FA212	$5.95

PS-2 Keyboard Replacement Cable

Custom-Length Keyboard Cable.

- **Replacement keyboard cables in the length you need.**
- **Maximum length of 25 feet (7.6 m). For greater distance, use the KVM Extender/Sharer for VGA (AC230A), shown on page 229.**

Connect your keyboard to a PS/2 CPU with the PS-2 Keyboard Replacement Cable. This cable has SDL and 6-pin Mini DIN connectors. It's perfect as an extended-length replacement for your existing keyboard cable, or you can use it with our KVM Extender/Sharer for VGA.

6-Pin Mini DIN

SDL

The PS-2 Keyboard Replacement Cable is not coiled, and it's available in lengths up to 25 feet (7.6 m).

Item	Code	Price
PS-2 Keyboard Replacement Cable	EVNPS02	$28.00 + $0.27/ft.

In This Section...
UTP
STP
Fiberoptic
Coax, Twinax, & Ethernet
Token Ring
RS-232

RGBS Video Cable

Move Your Monitor up to 50 Feet Away.

- Four BNC to four BNC connectors.
- Move your monitor anywhere from 5 to 50 feet (1.5 to 15.2 m) away.

NOTE: Also available in MF versions.

Item		Code	Price
RGBS Video Cable			
M/M	5-ft. (1.5-m)	EYNRGBS2-0005-MM	**$59.00**
	10-ft. (3.0-m)	EYNRGBS2-0010-MM	**$64.95**
	25-ft. (7.6-m)	EYNRGBS2-0025-MM	**$83.95**
	50-ft. (15.2-m)	EYNRGBS2-0050-MM	**$113.95**
F/F	5-ft. (1.5-m)	EYNRGBS2-0005-FF	**$59.00**
	10-ft. (3.0-m)	EYNRGBS2-0010-FF	**$64.95**
	25-ft. (7.6-m)	EYNRGBS2-0025-FF	**$83.95**
	50-ft. (15.2-m)	EYNRGBS2-0050-FF	**$113.95**

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Mac Video Extension Cable

Move Your Mac Monitor.

- Connect a Mac® video port to a monitor with red, green, blue, and sync inputs.
- Molded BNC leads provide strain-relief, and woven shielding blocks EMI/RFI interference.

PLUS! Apple Cables, see pp. 112–113.

Item	Code	Price
Mac Video Extension Cable DB15M-4 BNC 6-ft. (1.8-m)	EYRGBS3-0006	**$49.95**

Video Cable 13C3

Sun® Connectivity Solutions.

Item		Code	Price
Video Cable 13C3			
M/M	6-ft. (1.8-m)	EVMVDT02-0006-MM	**$98.00**
	10-ft. (3.0-m)	EVMVDT02-0010-MM	**$106.00**
	25-ft. (7.6-m)	EVMVDT02-0025-MM	**$130.00**
	50-ft. (15.2-m)	EVMVDT02-0050-MM	**$170.00**
	Custom Lengths	EVMVDT02-MM	**$96.90 + $1.62/ft.**
M/F	6-ft. (1.8-m)	EVMVDT02-0006-MF	**$98.00**
	10-ft. (3.0-m)	EVMVDT02-0010-MF	**$106.00**
	25-ft. (7.6-m)	EVMVDT02-0025-MF	**$130.00**
	50-ft. (15.2-m)	EVMVDT02-0050-MF	**$170.00**
	Custom Lengths	EVMVDT02-MF	**$96.90 + $1.62/ft.**
F/F	6-ft. (1.8-m)	EVMVDT02-0006-FF	**$98.00**
	10-ft. (3.0-m)	EVMVDT02-0010-FF	**$106.00**
	25-ft. (7.6-m)	EVMVDT02-0025-FF	**$130.00**
	50-ft. (15.2-m)	EVMVDT02-0050-FF	**$170.00**
	Custom Lengths	EVMVDT02-FF	**$96.90 + $1.62/ft.**

- This cable works with either color or monochrome formats—with no loss of resolution.
- It's also compatible with Apple® monochrome monitors.
- High-quality 75-ohm coax and twisted-pair cable.

ABSOLUTELY GUARANTEED FOR LIFE

EVMVDT02

SPECIFICATIONS

Coax Components:
Capacitance — 65.6 pF/m, 10 to 300 KHz
Impedance — 75 ohms
Resistance — 110 ohms max/1000 ft. @ 20° C
Velocity of Propagation — 72% min.

Twisted-Pair Components:
Capacitance — 91.8 pF/m
Resistance — 72 ohms max/1000 ft. @ 20° C

Sun 13W3 to HD15F Adapter

Connect Your Sun Workstation to a VGA Screen.

New

Connect your Sun® Workstation® or other graphic workstations with the same interface to a standard VGA or SVGA screen with the BLACK BOX® Sun 13W3 to HD15F.

It has a 13W3 male Sun connector on one side to plug into the workstation, and an HD 15-pin female VGA connector on the other side to connect to your VGA screen.

- **Connect your Sun® Workstation® to a standard VGA monitor.**
- **13W3 male connector to an HD 15-pin female connector.**

Item	Code	Price
Sun 13W3 to HD15F Adapter	ACD002	**$34.95**

The Problem

"I have a large computer/video/scanner system with many stations and operators. Each operator connects and disconnects the cables every day. It was a problem because people were accidentally breaking pins and ruining the connectors. Each station would be down until a replacement cable could be found—there had to be a better way."

BLACK BOX SOLUTION

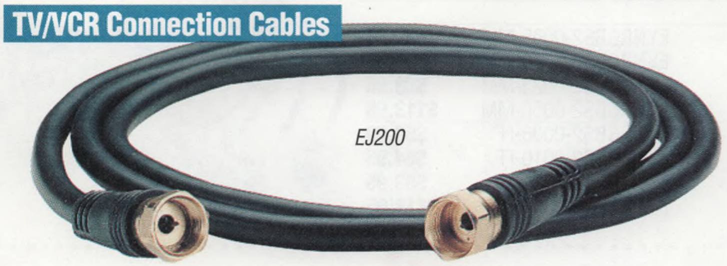
"I knew Black Box made custom cables—so I called. Black Box came up with a unique Y cable with a special disconnect. Now I can break the cable connection while leaving the equipment connections intact. It works great—I haven't had one cable problem since! Thanks, Black Box."

Joe Rossi, North American Morpho Systems, Inc.

MORE! VGA Video Adapters HOT NEW PRODUCTS

Make Golden TV/VCR Hookups with Premium BLACK BOX® Cables.

TV/VCR Connection Cables



Black Box Explains...

Gold Plating.

Get premium quality connectors from Black Box. 24-karat gold plating ensures better signal transmission and no corrosion. The shielding and heavy gold conductors provide improved performance.

- Designed for RG59/U cable.
- Fully shielded with braided copper to minimize interference.
- 24-karat gold-plated connectors.
- Use the F-type plug version to connect VCRs and TVs, video amplifiers, antennas, and more.
- Use the RCA plug to carry one channel of audio between a stereo TV or VCR audio output, or as an extension to an existing cable terminated with RCA® jacks.

Item	Code	Price
TV/VCR Connection Cables		
Screw-On RG59 Plugs, 75-ohm, F-Type		
3-ft. (0.9-m)	EJ200	**$4.95**
6-ft. (1.8-m)	EJ200-0006	**$6.95**
12-ft. (3.6-m)	EJ200-0012	**$8.95**
25-ft. (7.6-m)	EJ200-0025	**$16.95**
Slip-On RG59 Plugs. 75-ohm, F-Type		
3-ft. (0.9-m)	EJ202-0003	**$4.95**
6-ft. (1.8-m)	EJ202-0006	**$6.95**
12-ft. (3.6-m)	EJ202-0012	**$8.95**
25-ft. (7.6-m)	EJ202-0025	**$16.95**
RCA Plugs 6-ft. (1.8-m)	EJ201	**$6.95**

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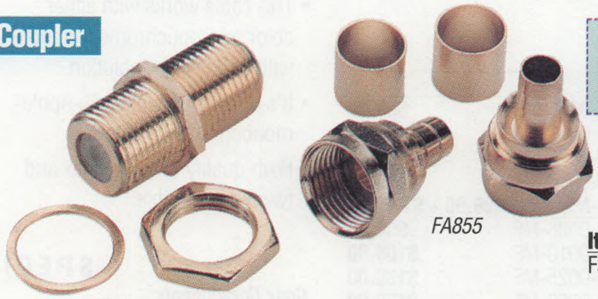
F59-Type Video Plugs and Video Coupler

F59-Type Video Plugs

- Solderless F59 plugs for RG59/U cable.
- 24-karat gold-plated connectors.

Video Coupler

- Female-to-female adapter for extending cable runs terminated with a male F-type plug.
- 24-karat gold-plated connectors.



FAXBACK INFORMATION
For All Items on This Page: 14443
Call 412-746-5500 Anytime

Item	Code	Price
F59-Type Video Plugs (2 Per Pack)	FA854	**$1.95**
Video Coupler, F/F	FA855	**$1.95**

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Video Connectors

75-Ohm Hybrid (UHF/VHF) Splitters

- Divides one incoming 75-ohm signal into two or three with minimal loss.
- 24-karat gold-plated connectors for better connections.

Right-Angle Slip-On Video Balun

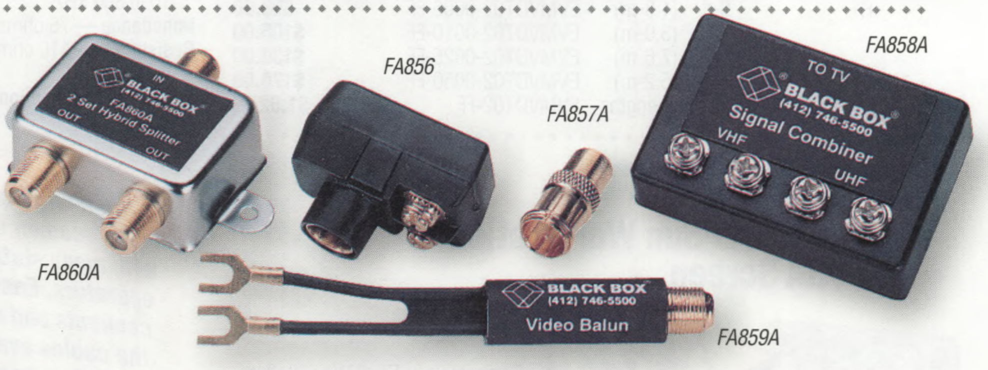
- Quick-Connect matching transformer.
- Use with a 300-ohm twin-lead antenna system and a TV/VCR with a 75-ohm antenna input.
- A screwdriver and sharp knife are the only tools required.
- 24-karat gold-plated connectors.

Video Adapter/Slip-On Connector

- Features an F-type jack and a Quick-Connect-type plug to adapt male F-type cable-ends into Quick-Connect plugs.
- 24-karat gold-plated connectors.

Signal Combiner (75 to 300 Ohms)

- Combine VHF and UHF signals into one 75-ohm signal for input to a TV or VCR.
- Use it in reverse as a splitter.
- Designed for 300-ohm VHF and UHF antennas or VCR outputs.
- Features a Quick-Connect plug for the connector on your set.



Video Balun

- Use the matching transformer to connect a 75-ohm antenna system to a TV/VCR via the 300-ohm antenna input.
- Or connect a VCR's VHF output to a TV's 300-ohm VHF input.
- Connect directly to the terminals of an indoor 300-ohm antenna.

NOTE: Not for use outdoors.

Item	Code	Price
75-Ohm Hybrid (UHF/VHF) Splitters		
Two-Set	FA860A	**$4.95**
Three-Set	FA861A	**$6.95**
Right-Angle Slip-On Video Balun	FA856	**$2.95**
Video Adapter/Slip-On Connector	FA857A	**$2.95**
Signal Combiner	FA858A	**$5.95**
Video Balun	FA859A	**$2.95**

Shielded Y Cord Split Your Audio Hook-Ups.

- Split a single audio signal into two, or combine two audio signals into one.
- All connectors feature molded strain reliefs.

Item	Code	Price
Shielded Y Cord, 4-in. (10.2-cm)		
RCA Plug M/2 RCA Jacks F-F	EJ400	$4.95
RCA Jack F/2 RCA Plugs M-M	EJ401	$4.95
3.5-mm Mini Plug/2 RCA Jacks F-F	EJ402	$2.95

The molded RCA plugs are 24-karat gold-plated for better connections and sound. (EJ400 shown)

FAXBACK INFORMATION
For All Items on This Page: 14443
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Stereo Connection Cables Make Solid Stereo Connections.

- Fully shielded, 20-gauge stranded copper cable.
- 24-karat gold-plated RCA® plugs with molded strain reliefs.
- Carry two channels of stereo signal between an amplifier/receiver and a cassette deck, stereo TV, CD player, etc.
- Choose the length you need.

Item	Code	Price
Stereo Connection Cables		
3-ft. (0.9-m)	EJ100-0003	$7.95
6-ft. (1.8-m)	EJ100-0006	$8.95
12-ft. (3.6-m)	EJ100-0012	$12.95

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Deluxe Stereo Connection Cables 24-Karat Gold-Plated Connectors Give Top-Quality Performance.

- Heavy-duty, dual-shielded cable constructed with metallic foils and braided copper.
- Easy to plug in. One side terminates with right-angle RCA plugs.
- Color-banding for left/right audio channel ID.

Item	Code	Price
Deluxe Stereo Connection Cables		
1.5-ft. (0.4-m)	EJ500-0001	$23.95
3.0-ft. (0.9-m)	EJ500-0003	$28.95
6.0-ft. (1.8-m)	EJ500-0006	$31.95

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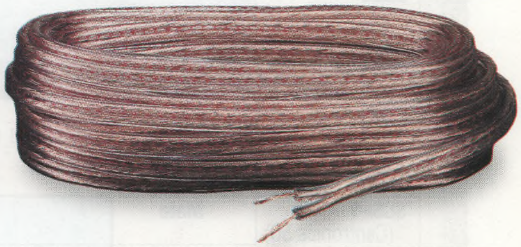
Speaker Wire Heavy-Duty for Great Sound—No Static!

- Connect your speakers to your stereo components.
- Parallel conductors.
- 16-gauge (25-ft.) or 18-gauge (50- and 100-ft.) wire.

Item	Code	Price
Speaker Wire, Parallel Conductors		
25-ft. (7.6-m)	EJ505-0025	$10.95
50-ft. (15.2-m)	EJ505-0050	$13.95
100-ft. (30.5-m)	EJ505-0100	$23.95



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Mini Stereo Headphone Extension Cord Break the 3-ft. Sound Barrier.

- Extends the range of mini-headphones or speakers to 10 ft. (3 m).
- Right-angle, 3.5-mm stereo plug on one end, 3.5-mm stereo jack on the other.
- All connectors have molded strain reliefs.

NOTE: Requires a 3.5-mm-to-¼" plug adapter for full-size headphones or stereo components.

Item	Code	Price
Mini Stereo Headphone Extension Cord		
10-ft. (3-m) Extended	EJ501	$7.95

◆ ◆ ◆

CD-ROM Audio Cable

Superior Mini-Coax Technology to Connect Your CD-ROM Audio Port to Your Sound Card.

ABSOLUTELY GUARANTEED FOR LIFE

EN001

- Transfer signals for clean, noise-free sound.

Item	Code	Price
CD-ROM Audio Cable		
SONY® to Creative Labs®	EN001	$19.95
SONY CDU55E or NEC to Creative Labs	EN002	$19.95
NEC External Drive to SCSI	EN003	$19.95
NEC 4XI to Creative Labs	EN004	$29.95
NEC to Media Vision®	EN005	$19.95
Toshiba® to Media Vision	EN006	$19.95

FAXBACK INFORMATION
Request Document Number: 12764
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PLUS! Add CD-ROM to your LAN, see pp. 234–239.

SCSI Cables, Adapters, Terminators.

Make all your SCSI connections with Black Box. Whether you need to connect SCSI-1, -2, or -3, or a combination of all three, you'll find all the SCSI cables, adapters, and terminators you need.

To choose your cable or adapter, refer to the handy charts **below.** Determine what connector you need on each end of your cable or adapter. Locate Connector 1 down the left of the chart, then locate Connector 2 across the top of the chart.

Not sure which SCSI cables, adapters, or terminators you need? Get the answer fast with a call to Black Box Technical Support at **412-746-5500. Press 122** to talk to one of the experts on our Connectivity team. You'll get free advice and guidance in deciphering SCSI-1, -2, and -3, and choosing the right cables, adapters, and terminators for your equipment.

PLUS! SCSI Terminators, **see p. 101.**

SCSI CABLES

Cable Connector 1	**SCSI-1** (Telco 50)	**SCSI-2** (Micro D50) (Micro DB50)	**SCSI-3** (Micro D68) (Mini 68)	**DB50**	**Micro Ribbon 68**	**DB25**	**Micro Ribbon 60**
	Cable Connector 2						
SCSI-1 (Centronics 50) (Telco 50)	EVMS2 M/M EVMS3 M/F **p. 98**	EVMSC02 M/M **p. 98**		EVMSC04 **p. 98**	EVMS5 **p. 99**	EVMS1 **p. 100**	EVMSC03 **p. 99**
SCSI-2 (Micro D50) (Mini 50) (Micro DB50)		EVMSC01 M/M, M/F **p. 98**		EVMSC05 M/M **p. 98**	EVMS6 **p. 99**		
SCSI-3 (Micro D68) (Mini 68)	EVMS9 **p. 99**	EVMS4 **p. 99**	EVNSC07 **p. 99**		EVMS7 **p. 99**		
DB50				EVMSC06 M/M **p. 98**			
DB25						EVMS12 M/F EVMS13 M/M **p. 100**	

SCSI ADAPTERS

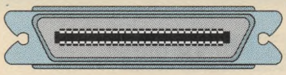
		Adapter Connector 2							
		SCSI-1 (Centronics 50)		**SCSI-2** (Micro D50)		**SCSI-3** (Micro D68)		**DB50**	
Adapter Connector 1	**Gender**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
SCSI-1 (Centronics 50)	**Male**								FA171 **p. 97**
	Female		FA170 **p. 97**	FA484 **p. 97**				FA172 **p. 97**	
SCSI-2 (Micro D50)	**Male**								FA174 **p. 97**
	Female	FA485 **p. 97**			FA173 **p. 97**			FA483 **p. 97**	
SCSI-3 (Micro D68)	**Male**		FA175 **p. 97**		FA177 **p. 97**				
	Female			FA176 **p. 97**			FA178 **p. 97**		

SCSI MAC® ADAPTERS

		Adapter Connector 2							
		SCSI-1 (Centronics 50)		**HDI30**		**SCSI-2** (Micro D50)		**DB25**	
Adapter Connector 1	**Gender**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
SCSI-1 (Centronics 50)	**Male**							FA480 **p. 113**	
	Female		FA170 **p. 97**	FA492 **p. 113**					FA481 **p. 113**
SCSI-2 (Micro D50)	**Male**								FA201 **p. 113**
	Female						FA173 **p. 113**	FA202 **p. 113**	
DB25	**Male**								
	Female			FA490 **p. 113**					

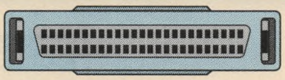
Black Box Explains...

SCSI-1.



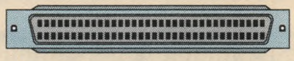
The original SCSI standard was approved in 1986. It supports transfer rates of up to 5 Mbps and 7 SCSI devices on an 8-bit bus. The most common connector for SCSI-1 is the **Centronics® 50** or **Telco 50**.

SCSI-2.



Approved in 1994, SCSI-2 introduced optional 16- and 32-bit buses called "Wide SCSI." The transfer rate, normally 10 Mbps, can go up to 40 Mbps when combined with Fast and Wide SCSI. SCSI-2 usually uses a **MicroD 50-pin** connector with thumbclips. Also known as **Mini 50** or **Micro DB50**.

SCSI-3.

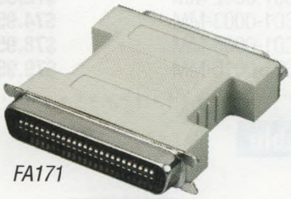


Found in many high-end systems, SCSI-3 commonly uses a **MicroD 68-pin** connector with thumbscrews.

The most common bus width for SCSI-3 is 16-bit with transfer rates at 20 Mbps. Serial-bus and fiber-channel protocols are in development. Also known as **Mini 68**.

SCSI Adapters

Connect All Your SCSI Devices—1, 2, 3!



FA171

FA174

FA176

EVNSCT22

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Item	Code	Price
SCSI-1		
Female to Female	FA170	$15.95
Male to DB50 Female	FA171	$29.95
Female to DB50 Male	FA172	$32.95
SCSI-2		
Female to SCSI-1 Male	FA485	$35.00
Female to SCSI-2 Male	FA484	$35.00
Female to SCSI-2 Female	FA173	$31.95
Female to DB50 Male	FA483	$35.00
Male to DB50 Female	FA174	$38.95
SCSI-3		
Male to SCSI-1 Female	FA175	$44.95
Female to SCSI-2 Male	FA176	$49.95
Male to SCSI-2 Female	FA177	$49.95
Female to SCSI-3 Female	FA178	$31.95

FAXBACK INFORMATION
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PLUS!

Item	Code	Price
SCSI-2 Female to 50-Pin Header Adapter	EVNSCT22	$25.00
SCSI-3 Female to IDC50 Female Adapter	FA482	$44.00

Single-Drive Loop Cable

Connect with Internal SCSI-1 and SCSI-2 Drive Loop Cables.

ABSOLUTELY GUARANTEED FOR LIFE

EVMSCC01

EVMSCC02

- Use either Internal Single-Drive Loop Cable when you put a SCSI device in an external case.
- Both feature internal 50-position IDC sockets for internal drives.
- Both are 10" long.

Item	Code	Price
Internal Single-Drive Loop Cable		
SCSI-2 Female/Female	EVMSCC01	$39.00
SCSI-1 Female/Female	EVMSCC02	$19.00

Internal Two-Drive Cable

Make Dual-Drive SCSI Connections.

ABSOLUTELY GUARANTEED FOR LIFE

EVMSCC03

- This Internal Two-Drive Loop Cable can be used with two SCSI devices in a single-drive case.
- Features straight-through 50-position connectors.
- Features (3) IDC 50-position sockets spaced 8" and 16" apart for a total length of 24".

Item	Code	Price
Internal Two-Drive Cable	EVMSCC03	$15.00

PLUS! Apple Cables, see pp. 112–113.

Internal SCSI-3 Cables

Make Multiple SCSI-3 Connections.

ABSOLUTELY GUARANTEED FOR LIFE

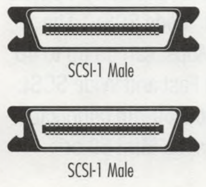
EVMSCC12

- Here's an easy way to make multiple SCSI-3 connections. Just choose the number of connectors you need: 2, 5, or 7.

Item	Length	Drives	Code	Price
Internal SCSI-3 Cables				
	28"	2	EVMSCC08	$34.95
	52"	5	EVMSCC10	$64.95
	68"	7	EVMSCC12	$85.95

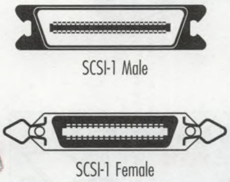
SCSI Cables for Your PC and Workstation.

SCSI-1 Male to SCSI-1 Male Cable


SCSI-1 Male
SCSI-1 Male

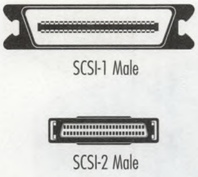
Item	Code	Price
SCSI-1 Male to SCSI-1 Male Cable		
2-ft. (0.6-m)	EVMS2-0002	$45.00
3-ft. (0.9-m)	EVMS2-0003	$47.95
6-ft. (1.8-m)	EVMS2-0006	$59.95
10-ft. (3.0-m)	EVMS2-0010	$64.95

SCSI-1 Male to SCSI-1 Female Cable


SCSI-1 Male
SCSI-1 Female

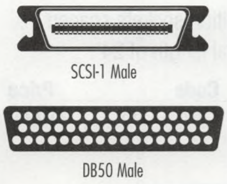
Item	Code	Price
SCSI-1 Male to SCSI-1 Female Cable		
3-ft. (0.9-m)	EVMS3-0003	$26.00
6-ft. (1.8-m)	EVMS3-0006	$29.00
10-ft. (3.0-m)	EVMS3-0010	$39.00

SCSI-1 Male to SCSI-2 Male Cable


SCSI-1 Male
SCSI-2 Male

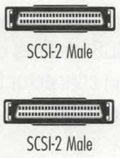
Item	Code	Price
SCSI-1 Male to SCSI-2 Male Cable		
2-ft. (0.6-m)	EVMSC02-0002-MM	$66.95
3-ft. (0.9-m)	EVMSC02-0003-MM	$68.95
6-ft. (1.8-m)	EVMSC02-0006-MM	$70.95
10-ft. (3.0-m)	EVMSC02-0010-MM	$79.95

SCSI-1 Male to DB50 Male Cable


SCSI-1 Male
DB50 Male

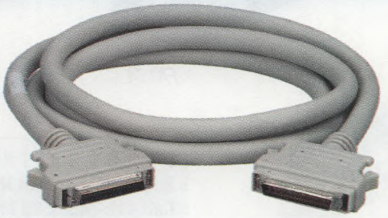
Item	Code	Price
SCSI-1 Male to DB50 Male Cable		
6-ft. (1.8-m)	EVMSC04-0006-MM	$74.95

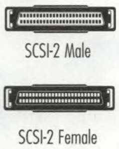
SCSI-2 Male to SCSI-2 Male Cable


SCSI-2 Male
SCSI-2 Male

Item	Code	Price
SCSI-2 Male to SCSI-2 Male Cable		
2-ft. (0.6-m)	EVMSC01-0002-MM	$72.95
3-ft. (0.9-m)	EVMSC01-0003-MM	$74.95
6-ft. (1.8-m)	EVMSC01-0006-MM	$78.95
10-ft. (3.0-m)	EVMSC01-0010-MM	$79.95

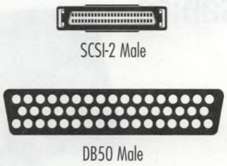
SCSI-2 Male to SCSI-2 Female Cable




SCSI-2 Male
SCSI-2 Female

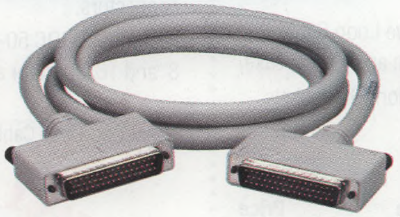
Item	Code	Price
SCSI-2 Male to SCSI-2 Female Cable		
6-ft. (1.8-m)	EVMSC01-0006-MF	$79.95
10-ft. (3.0-m)	EVMSC01-0010-MF	$83.95

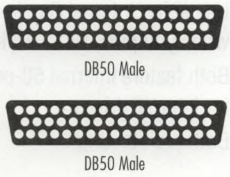
SCSI-2 Male to DB50 Male Cable


SCSI-2 Male
DB50 Male

Item	Code	Price
SCSI-2 Male to DB50 Male Cable		
6-ft. (1.8-m)	EVMSC05-0006-MM	$85.95

DB50 Male to DB50 Male Cable

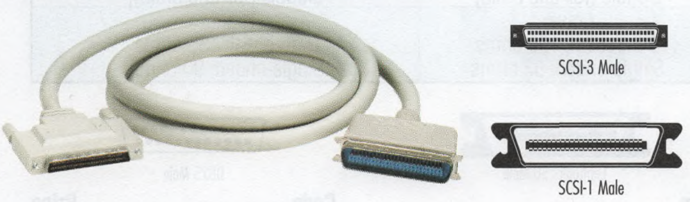



DB50 Male
DB50 Male

Item	Code	Price
DB50 Male to DB50 Male Cable		
6-ft. (1.8-m)	EVMSC06-0006-MM	$79.95

SCSI Cables for Your IBM® 6000, PS/2®, and SCSI-3 Equipment.

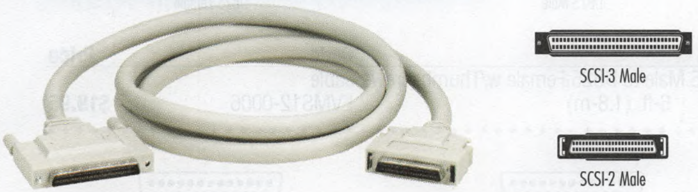
SCSI-3 Male to SCSI-1 Male Cable



- Connect SCSI-1 devices to a Fast and Wide controller.

Item	Code	Price
SCSI-3 Male to SCSI-1 Male Cable		
5-ft. (1.5-m)	EVMS9-0005	**$80.00**

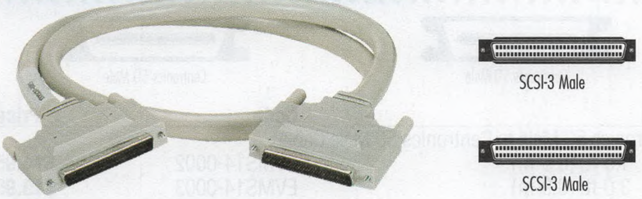
SCSI-3 Male to SCSI-2 Male Cable



- Connect SCSI-2 devices to a Fast and Wide controller.

Item	Code	Price
SCSI-3 Male to SCSI-2 Male Cable		
5-ft. (1.5-m)	EVMS4-0005	**$90.00**

SCSI-3 Male to SCSI-3 Male Cable



- Made from 34-pair wire, this Cable conforms to the SCSI-3 standard.

Item	Code	Price
SCSI-3 Male to SCSI-3 Male Cable		
3-ft. (0.9-m)	EVNSC07-0003	**$125.00**
6-ft. (1.8-m)	EVNSC07-0006	**$135.00**

Buy Cables with Confidence...

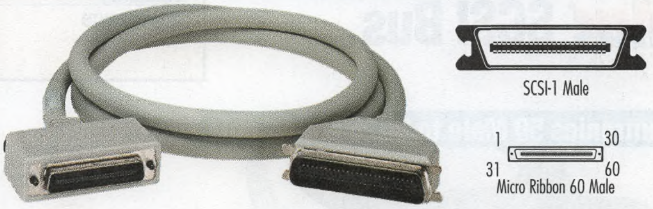
Because when you buy BLACK BOX® copper cable, you're also buying the Black Box promise—that the cable you order today will serve you reliably tomorrow and every day afterward.

How can we be so sure?

Superior materials, quality manufacturing processes, and proven reliability ratings—that's the stuff our copper cables are made of. It's why we think offering a Lifetime Guarantee is the easy part. And it's why you can order from Black Box with confidence.

So Call Black Box—TODAY.

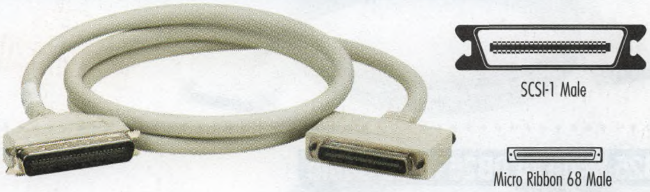
SCSI-1 Male to Micro Ribbon 60 Male Cable



- Connect to equipment with a SCSI micro interface.

Item	Code	Price
SCSI-1 Male to Micro Ribbon 60 Male Cable		
5-ft. (1.5-m)	EVMSC03-0005-MM	**$93.95**

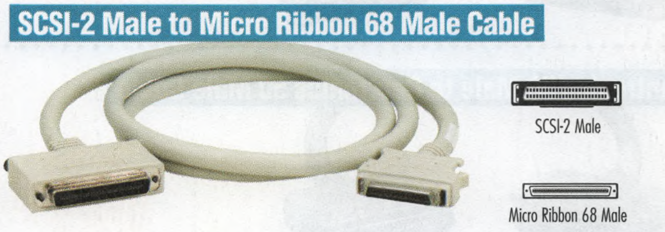
SCSI-1 Male to Micro Ribbon 68 Male Cable



- Connect SCSI-1 devices to an IBM® SCSI controller.

Item	Code	Price
SCSI-1 Male to Micro Ribbon 68 Male Cable		
5-ft. (1.5-m)	EVMS5-0005	**$97.00**

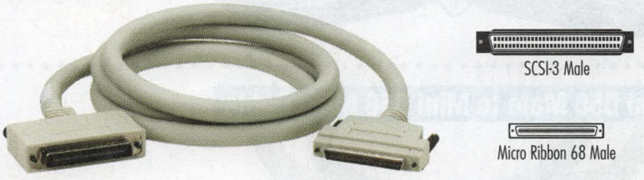
SCSI-2 Male to Micro Ribbon 68 Male Cable



- Connect SCSI-2 devices to an IBM SCSI controller.

Item	Code	Price
SCSI-2 Male to Micro Ribbon 68 Male Cable		
5 ft. (1.5-m)	EVMS6-0005	**$109.00**

SCSI-3 Male to Micro Ribbon 68 Male Cable



- Link Fast and Wide SCSI devices to an IBM SCSI controller.

Item	Code	Price
SCSI-3 Male to Micro Ribbon 68 Male Cable		
5-ft. (1.5-m)	EVMS7-0005	**$125.00**

MORE! SCSI Apple Cables, **see p. 113.**

PLUS! SCSI Converters and Extenders, **see pp. 338–339.**

MORE! SCSI Cables, **see p. 100.**

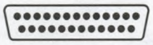
Here Are All the Cables You Need to Connect Your Mac® SCSI Bus.

Mac VS. PC/WORKSTATION SCSI CABLES

	Mac SCSI	PC/Workstation SCSI
Connectors	DB25, HDI30 Centronics 50, Micro D50	Centronics® 50, Micro D50 Micro D68, Micro Ribbon 60 and 68
No. of Conductors	38 (19 twisted pair)	50 and 68 (25 and 34 twisted pair)
Gauge	26 AWG	28 AWG
Shielding	Double (foil and braid)	Double (foil and braid)
Impedance	Lower Differential: 100 ohms Single-ended: 63 ohms	Higher Differential: 135 ohms Single-ended: 90 ohms

Centronics 50 Male to DB25 Male Cable

Centronics 50 Male


DB25 Male

Item	Code	Price
Centronics 50 Male to DB25 Male Cable		
2-ft. (0.6-m)	EVMS1-0002	$17.95
6-ft. (1.8-m)	EVMS1-0006	$24.95
10-ft. (3.0-m)	EVMS1-0010	$30.95

DB25 Male to DB25 Female Cable

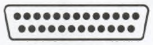
DB25 Male

DB25 Female

Item	Code	Price
DB25 Male to DB25 Female w/Thumbscrews Cable		
6-ft. (1.8-m)	EVMS12-0006	$19.95

DB25 Male to DB25 Male Cable

DB25 Male


DB25 Male

Item	Code	Price
DB25 Male to DB25 Male w/Thumbscrews Cable		
2-ft. (0.6-m)	EVMS13-0002	$12.95

Centronics 50 Male to Centronics 50 Male Cable

Centronics 50 Male

Centronics 50 Male

Item	Code	Price
Centronics 50 Male to Centronics 50 Male Cable		
1.5-ft. (0.5-m)	EVMS14-0002	$14.95
3.0-ft. (0.9-m)	EVMS14-0003	$19.95
6.0-ft. (1.8-m)	EVMS14-0006	$24.95

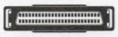
Centronics 50 Male to Centronics 50 Female Cable

Centronics 50 Male

Centronics 50 Female

Item	Code	Price
Centronics 50 Male to Centronics 50 Female Cable		
2-ft. (0.6-m)	EVMS15-0002	$19.95
6-ft. (1.8-m)	EVMS15-0006	$29.95

Mini D50 Male to Mini D50 Male Cable


Mini D50 Male

Mini D50 Male

Item	Code	Price
Mini D50 Male to Mini D50 Male Cable		
3-ft. (0.9-m)	EVMS17-0003	$39.95
6-ft. (1.8-m)	EVMS17-0006	$49.95

Mini D50 Male to DB25 Male Cable

Mini D50 Male

DB25 Male

Item	Code	Price
Mini D50 Male to DB25 Male Cable		
3-ft. (0.9-m)	EVMS18-0003	$39.95

Terminators for All SCSI Devices—with Lifetime Guarantees.

Black Box Explains...

Choosing SCSI Cables.

1. Quality. Your system's performance depends on the quality of your SCSI cables. Without high-quality cables specifically designed for SCSI applications, you could be jeopardizing your SCSI lifeline. Inferior cables, adapters, and terminators can cause random errors, data corruption, or even a system crash! Black Box SCSI cables and components are the absolute best-quality products. And they're *guaranteed for life.*

2. Length. Assure peak network performance by making sure your cables are the right length. As cable runs get longer, signals weaken and are more susceptible to noise. Always use the shortest cable for the task. And stay within the SCSI-1 and SCSI-2 standards of six meters or three meters for Fast SCSI. Remember, this is the total length of the bus, including all internal and external cables.

Passive Termination.

This is the oldest method of termination. A passive terminator sits on the bus to minimize reflections at the end of the cable. Passive terminators simply provide impedance close to the impedance of the cable. The terminator is passive since it doesn't do any work to regulate power for termination; it relies on the interface card to provide steady power.

Active Termination.

This is the more stable form of terminating SCSI cables. Active Terminators control the impedance at the end of the SCSI bus by using a voltage regulator, not just the power supplied by the interface card.

Forced-Perfect Termination.

Of all SCSI terminators, this is the most complex. A cable with a Forced-Perfect Terminator can actually change its impedance to compensate for variations along the bus. Forced-Perfect Terminators force the impedance of the cable to match each device through diode switching and biasing.

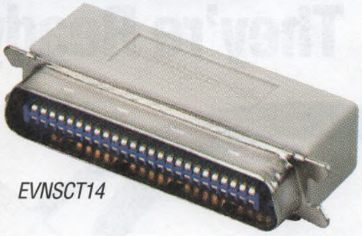
SCSI-3 Terminators

EVNSCT28

- 68-position SCSI-3 standard.
- Fits the latest SCSI devices.
- Single-ended or differential.

Item	Code	Price
SCSI-3 Terminators		
Micro D68, Male		
Active, Low Profile	EVNSCT12	$60.00
Differential, Low Profile	EVNSCT11	$55.00
Active, Thumbclips	EVNSCT04	$85.00
Micro D68, Female		
Active	EVNSCT28	$67.95

SCSI-1 Terminators

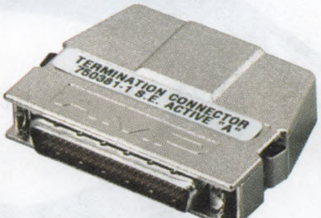


EVNSCT14

- For original SCSI-1 equipment.
- SCSI-1 (50-pin) standard.
- Single-ended or pass-through models.
- Lifetime guarantee.

Item	Code	Price
SCSI-1 Terminators, C50 Male		
Passive	EVNSCT07	$27.00
Active	EVNSCT21	$22.95
Differential	EVNSCT14	$18.00
Forced-Perfect	EVNSCT27	$69.95

SCSI-2 Terminators



EVNSCT02

EVNSCT05

- Single-ended or differential.
- Lifetime guarantee.

FAXBACK INFO
Request Document Number: 15523
Call 412-746-5500
Anytime

Item		Code	Price
External SCSI-2 Terminators			
Low Profile (0.224" high)			
Plastic Hood with Spring Latches, Single-Ended			
Passive	Unshielded	EVNSCT08	$35.00
Active	Shielded	EVNSCT09	$62.00
Passive	Shielded	EVNSCT10	$45.00
Standard Height (0.495" high)			
MD50			
Passive	Single-Ended	EVNSCT01	$49.00
Active	Single-Ended	EVNSCT02	$80.00
Passive	Differential	EVNSCT03	$55.00
Internal SCSI-2 Terminators			
IDC 50 Male			
IDC Socket	Active	EVNSCT05	$38.00
IDC Ribbon	Active	EVNSCT06	$39.00
Male, SS	Passive	EVNSCT20	$24.00
Male/Female	Passive	EVNSCT23	$32.00
Male/Female	Active	EVNSCT24	$49.00

DB50 Terminators

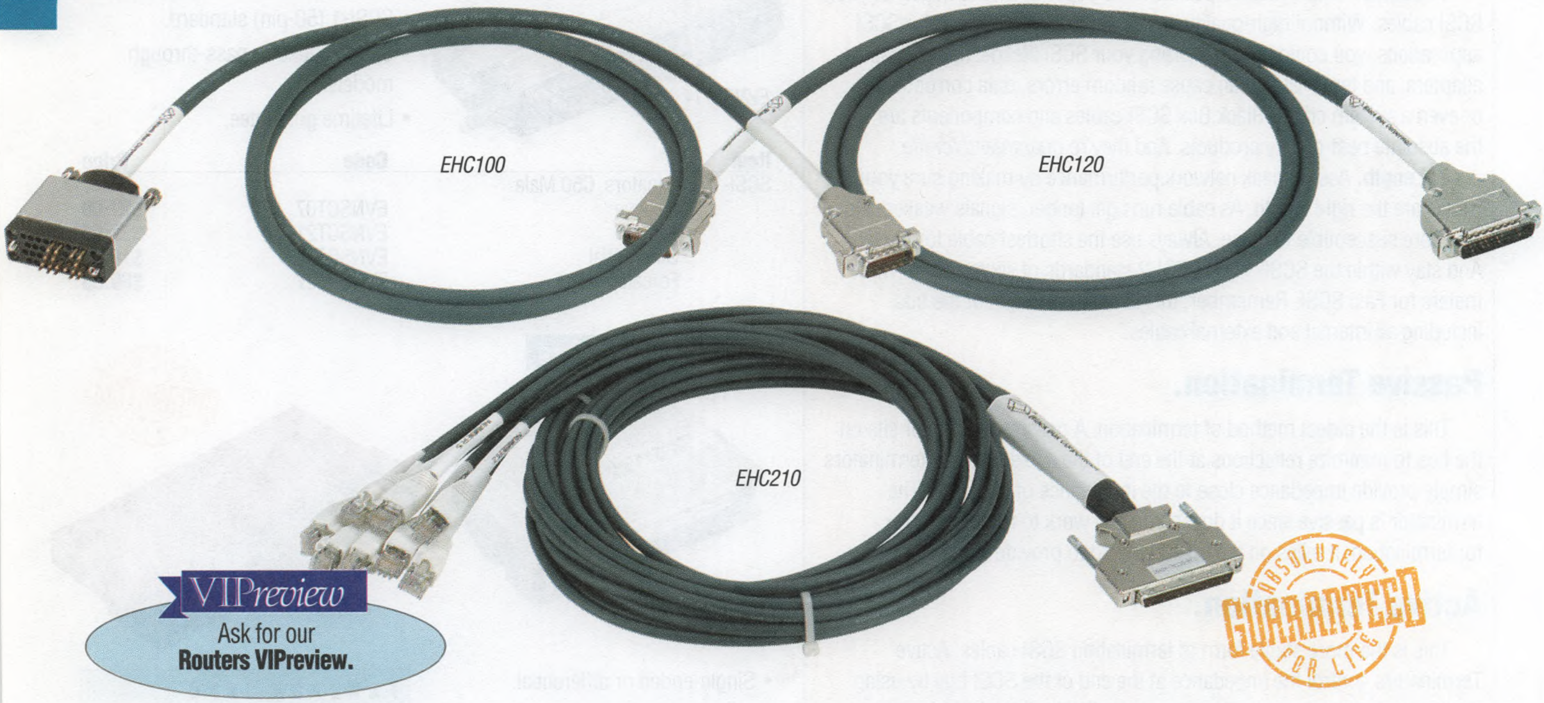
- DB50 standard.
- Active or passive.

Item	Code	Price
DB50 Terminators		
Passive	EVNSCT30	$34.95
Active w/Indicator LED	EVNSCT31	$44.95

EVNSCT31

Cables for Cisco Routers

Why Wait for Cables for Your Cisco Router? At Black Box, They're Ready to Ship to You Now!



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VIPreview

Ask for our **Routers VIPreview.**

- **Completely compatible with Cisco equipment.**
- **For Cisco 7000, 2500, and 4000 NP-4T, use: EHC100, EHC110, EHC120, EHC130, EHC140, EHC150, EHC160, EHC170, and EHC180.**
- **Use Octal cables for Cisco 2509 through 2512 series.**
- **Highest-quality construction.**
- **Features removable hoods.**
- **Custom lengths and plenum jackets are available. For more information, please call Tech Support.**

Our Cables for Cisco Routers are one more reason why Black Box is the source for your connectivity needs. Instead of waiting days or weeks for your Cisco Router replacement Cables, order them from Black Box today and have them tomorrow.

Be assured you'll receive high-performance, high-quality Cables. They've all been tested by our technical experts to ensure they meet our rigid quality standards. So you don't have to worry about sending your data over second-rate cable. And no network downtime!

Item	Code	Price
Cables for 7000, 2500, and 4000 NP-4T Series		
V.35 Cable, High-Density DB60 Male to V.35 Male		
DTE 6-ft. (1.8-m)	EHC100-0006	**$94.95**
10-ft. (3.0-m)	EHC100-0010	**$99.95**
DCE 6-ft. (1.8-m)	EHC110-0006	**$94.95**
10-ft. (3.0-m)	EHC110-0010	**$99.95**
RS-232 Cable, High-Density DB60 Male to DB25 Male		
DTE 6-ft. (1.8-m)	EHC120-0006	**$94.95**
10-ft. (3.0-m)	EHC120-0010	**$99.95**
DCE 6-ft. (1.8-m)	EHC130-0006	**$94.95**
10-ft. (3.0-m)	EHC130-0010	**$99.95**
RS-449 Cable, High-Density DB60 Male to DB37 Male		
DTE 6-ft. (1.8-m)	EHC140-0006	**$94.95**
10-ft. (3.0-m)	EHC140-0010	**$99.95**
EIA-530 Cable, High-Density DB60 Male to DB25 Male		
DTE 6-ft. (1.8-m)	EHC150-0006	**$94.95**
10-ft. (3.0-m)	EHC150-0010	**$99.95**
X.21 Cable, High-Density DB60 Male to DB15 Male		
DTE 6-ft. (1.8-m)	EHC160-0006	**$94.95**
10-ft. (3.0-m)	EHC160-0010	**$99.95**
HSSI Cable, MD50 to MD50		
DTE 10-ft. (3.0-m)	EHC170-0010	**$99.95**

Item	Code	Price
Cables for 4000 NP-2T Series		
V.35 Cable, DB50 Male to V.35 Male		
DTE 6-ft. (1.8-m)	EHC180-0006	**$94.95**
10-ft. (3.0-m)	EHC180-0010	**$99.95**
Cables for AGS+ Series		
V.35 Cable, High-Density DB26 Male to V.35 Male		
DTE 6-ft. (1.8-m)	EHC190-0006	**$94.95**
10-ft. (3.0-m)	EHC200-0010	**$99.95**
Octal Cables for 2509–2512 Series		
MD68 to (8) RJ-45 Shielded Plugs		
3-ft. (0.9-m)	EHC210-0003	**$199.95**
EHC210 plus (8) RJ-45 to DB25 Female Adapters		
3-ft. (0.9-m)	EHC220-0003	**$349.95**
EHC210 plus (8) RJ-45 to DB25 Male Adapters		
3-ft. (0.9-m)	EHC230-0003	**$349.95**
RJ-45 to DB25 Adapter, Shielded, Pinned	FA900	**$11.95**

FAXBACK INFO
Request Document Number: 17257
Call 412-746-5500
Anytime

Achieve Technical Enlightenment

BLACK BOX
Guide to Internetworking
ISDN
Bridges
Routers
Guide to Power & Data Protection
Pocket Glossary of Computer Terms
BUFFER
FIREWALL
ATM
NEWS
Guide to Premise Cabling

with Expert Information from Black Box.

When it comes to expert technical information, Black Box can turn you into a technical guru. We'll show you how to plan a premise wiring system, install and use sophisticated enterprise equipment, size different power-supply devices, and much more. Take a look at all we have to offer:

Item	Description	Code	Price
The BLACK BOX® *Pocket Glossary of Computer Terms*	The glossary the pros use! Over 1800 terms and phrases, plus informative Technology Overviews for easy reference.	AA830-R	$8.95
The BLACK BOX® *Guide to Power & Data Protection*	Find out how to safeguard your computer system from electrical hazards and keep downtime to a minimum.	AA800-R	$12.95
The BLACK BOX® *Guide to Print Sharing* New	Connect network users, boost productivity, save money! Read about switches, printer devices, emulation, and more! Worksheets and a helpful Buyer's Guide are included.	AA880	$14.95
The BLACK BOX® *Guide to Premise Cabling*	Your complete guide to EIA/TIA 568-compliant premise-wiring systems. Includes handy worksheets.	AA810-R	$24.95
The BLACK BOX® *Guide to Internetworking*	LAN/WAN concepts made easy. Learn how to perform successful, cost-effective installations. Worksheets included.	AA820	$24.95
Connectivity NEWS℠ (12 monthly issues—less than $9 a month!)	Your monthly update on cutting-edge technologies with informative articles, tips, and real-life solutions from our technical experts.	AA850	$99.95
The BLACK BOX® *Guide to Local and Remote Communications* New	What's right for your local or remote communications? Do you go analog or digital? Find out here.		*Coming Soon!*
Black Box Product-Reference Guides—Fill out the card between pp. 18 and 19.	• Cable and Connector • Equipment Protection • ServSwitch New • Bulk Cable New		FREE!

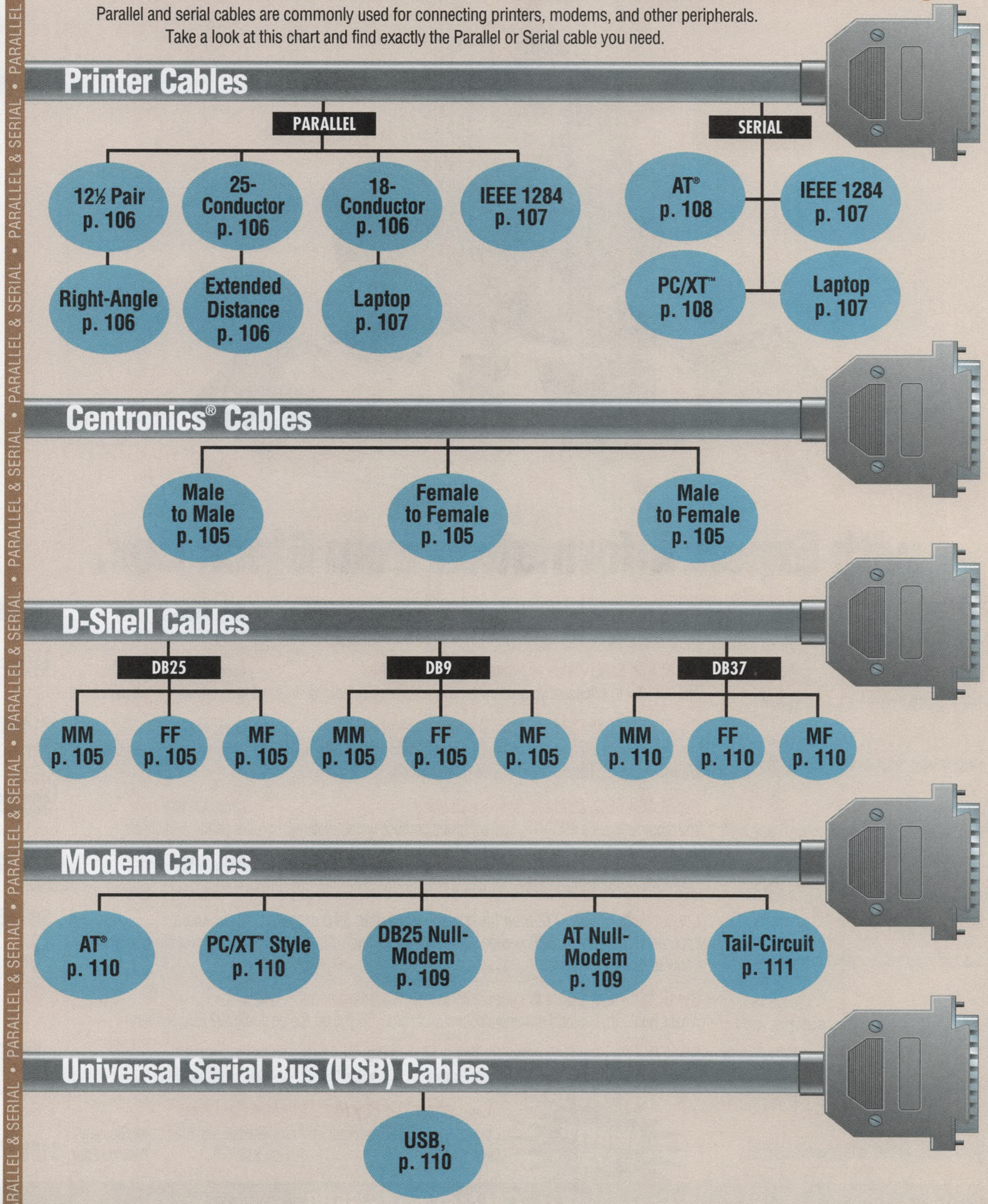
Save Over $25!

Save when You Buy the Complete Package:
Connectivity NEWS,℠ our four Technical Guides, and the Pocket Glossary!
Code: AA900 List: $186.70 **Package Price: $159.95!**

***ORDER TODAY!* CALL 412-746-5500.**

Find Your Parallel & Serial Cables, Quickly!

Parallel and serial cables are commonly used for connecting printers, modems, and other peripherals. Take a look at this chart and find exactly the Parallel or Serial cable you need.



Printer Cables

- PARALLEL
  - 12½ Pair p. 106
    - Right-Angle p. 106
  - 25-Conductor p. 106
    - Extended Distance p. 106
  - 18-Conductor p. 106
    - Laptop p. 107
  - IEEE 1284 p. 107
- SERIAL
  - AT® p. 108
  - IEEE 1284 p. 107
  - PC/XT™ p. 108
  - Laptop p. 107

Centronics® Cables

- Male to Male p. 105
- Female to Female p. 105
- Male to Female p. 105

D-Shell Cables

- DB25
  - MM p. 105
  - FF p. 105
  - MF p. 105
- DB9
  - MM p. 105
  - FF p. 105
  - MF p. 105
- DB37
  - MM p. 110
  - FF p. 110
  - MF p. 110

Modem Cables

- AT® p. 110
- PC/XT™ Style p. 110
- DB25 Null-Modem p. 109
- AT Null-Modem p. 109
- Tail-Circuit p. 111

Universal Serial Bus (USB) Cables

- USB, p. 110

Centronics Extension Cables

Extend Your Parallel Connections.

ABSOLUTELY GUARANTEED FOR LIFE
BC00102
GOOD

ABSOLUTELY GUARANTEED FOR LIFE
EQN380
BEST

Centronics Extension Cable, BC00101–BC00103 Series

- Compatible with most Centronics® applications.
- Typically used to connect a switch box with Centronics female connectors to a parallel printer.
- Fully molded with bail locks.
- 25-conductor configurations.
- 28 AWG with foil shield.

Item	Code	Price
Centronics Extension Cable, Centronics Male; Centronics Male		
6-ft. (1.8-m)	BC00101	**$9.95**
10-ft. (3.0-m)	BC00102	**$11.95**
15-ft. (4.6-m)	BC00103	**$13.95**

Centronics Compatible Cable, EQN380 Series

- Compatible with all Centronics applications.
- Low capacitance, foil and braid shielded.
- Non-molded assemblies with removable hoods for repinning.
- 24 AWG, 36-conductor cable (18 twisted pairs).
- Available with MM, MF, or FF connectors. (Specify length and gender when ordering.)
- Male connectors come standard with ears to accept bail latches.
- Male or female screwlocks may be specified at no extra charge.

Item	Code	Price
Centronics® Compatible Cable, MM, MF, or FF		
5-ft. (1.5-m)	EQN380-0005	**$32.30**
10-ft. (3.0-m)	EQN380-0010	**$35.55**
20-ft. (6.1-m)	EQN380-0020	**$38.75**
25-ft. (7.6-m)	EQN380-0025	**$43.05**
Custom Lengths	EQN380	**$30.15 + $.74/ft.**

◆ ◆ ◆

DB25 Extension Cable

Relocate Your DB25 Equipment!

- **Multipurpose DB25 serial cables.**
- **Extend existing serial cable up to 25 feet (7.6 m).**
- **All 25 pins connected straight through (1–1, 2–2,...25–25).**
- **Foil-shielded for EMI/RFI protection.**
- **Fully molded with thumbscrews.**

Place your serial printer or modem anywhere. Extend existing serial or parallel cables, connect a switch box, connect a modem—there are many uses for these DB extensions.

These cables have two DB25 connectors (female/female, male/female, or male/male), and they're connected straight through.

If you need distances longer than 25 feet (7.6 m), see our Extended Distance/Data Cables (**page 84**) and Extended Distance/Quiet Cables (**page 84**). These cables extend serial transmissions up to 500 ft. (150 m).

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Item		Code	Price
DB25 Extension Cable			
DB25 Female; DB25 Female	6-ft. (1.8-m)	BC00701	**$8.95**
	10-ft. (3.0-m)	BC00704	**$14.95**
	15-ft. (4.6-m)	BC00707	**$18.95**
	20-ft. (6.1-m)	BC00710	**$22.95**
	25-ft. (7.6-m)	BC00713	**$25.95**
DB25 Male; DB25 Female	6-ft. (1.8-m)	BC00702	**$12.95**
	10-ft. (3.0-m)	BC00705	**$14.95**
	15-ft. (4.6-m)	BC00708	**$18.95**
	20-ft. (6.1-m)	BC00711	**$22.95**
	25-ft. (7.6-m)	BC00714	**$25.95**
DB25 Male; DB25 Male	6-ft. (1.8-m)	BC00703	**$12.95**
	10-ft. (3.0-m)	BC00706	**$14.95**
	15-ft. (4.6-m)	BC00709	**$18.95**
	20-ft. (6.1-m)	BC00712	**$22.95**
	25-ft. (7.6-m)	BC00715	**$25.95**

NOTE: For Longer lengths, call Tech Support.

◆ ◆ ◆

DB9 Extension Cable (with EMI/RFI Hoods)

The Choice for Extending DB9 Serial Transmissions.

- EMI/RFI hoods for extra protection from outside interference.
- 100% foil-shielded.

Item	Code	Code	Code	Price
DB9 Extension Cable (with EMI/RFI Hoods)				
	Female/Female	*Male/Female*	*Male/Male*	
5-ft. (1.5-m)	EDN12H-0005-FF	EDN12H-0005-MF	EDN12H-0005-MM	**$19.95**
10-ft. (3.0-m)	EDN12H-0010-FF	EDN12H-0010-MF	EDN12H-0010-MM	**$22.95**
20-ft. (6.1-m)	EDN12H-0020-FF	EDN12H-0020-MF	EDN12H-0020-MM	**$26.95**
25-ft. (7.6-m)	EDN12H-0025-FF	EDN12H-0025-MF	EDN12H-0025-MM	**$28.95**
50-ft. (15.2-m)	EDN12H-0050-FF	EDN12H-0050-MF	EDN12H-0050-MM	**$39.95**
75-ft. (22.9-m)	EDN12H-0075-FF	EDN12H-0075-MF	EDN12H-0075-MM	**$51.95**
100-ft. (30.5-m)	EDN12H-0100-FF	EDN12H-0100-MF	EDN12H-0100-MM	**$62.95**
150-ft. (45.7-m)	EDN12H-0150-FF	EDN12H-0150-MF	EDN12H-0150-MM	**$84.95**
200-ft. (61.0-m)	EDN12H-0200-FF	EDN12H-0200-MF	EDN12H-0200-MM	**$107.95**
250-ft. (76.2-m)	EDN12H-0250-FF	EDN12H-0250-MF	EDN12H-0250-MM	**$129.95**
Custom Lengths	EDN12H-FF	EDN12H-MF	EDN12H-MM	**$22.65 + $.44/ft.**

ABSOLUTELY GUARANTEED FOR LIFE
EDN12H

Parallel Printer Cables

Connect Your Parallel Printer to Your PC.

ABSOLUTELY GUARANTEED FOR LIFE

GOOD
BC01601
BETTER
BC00202
BEST
EYN600

Space-Saving Right-Angle Connectors

Bidirectional Communications!

Dot-Matrix Printer (18-Conductor) Cable:

- Our most popular printer cable.
- Connects the parallel port of a computer to any standard parallel printer.
- Suitable for dot-matrix printers.
- Fully molded with thumbscrews.
- Features 18-conductor 28 AWG foil-shielded construction.

Printer Cable with Right-Angle Connectors:

- Right-angle Centronics® connector conserves space.
- Same features as the 18-Conductor Cable.

Laser-Printer (25-Conductor) Cable:

- Suitable for laser printers, such as the HP® LaserJet® IV or Lexmark™ 4039.
- Fully molded with thumbscrews.
- Features 25-conductor 28 AWG foil-shielded construction.

PLUS! Serial Printer Cables, see p. 108.

Bidirectional Communications (12½ Pair) Cable:

- This superior parallel printer cable is your best choice for protecting data.
- Features 12½ pairs of conductors for data integrity and bidirectional communications.
- Connectors are non-molded for easy repinning.
- Heavier gauge conductors—24 AWG for minimal resistance.

BUYER'S GUIDE

PARALLEL PRINTER CABLES

Connectors	Lengths		GOOD	BETTER	BEST
		Dot-Matrix	with Right-Angle Connector	Laser Printer	Bidirectional Communications
Centronics® Male DB25 Male	6-ft. (1.8-m)	BC00601 **$6.95**	BC01601 **$8.95**	BC00201 **$8.95**	EYN600-0006-MM **$13.95**
	10-ft. (3.0-m)	BC00602 **$9.95**	BC01602 **$11.95**	BC00202 **$11.95**	EYN600-0010-MM **$16.95**
	15-ft. (4.6-m)	BC00603 **$11.95**		BC00203 **$13.95**	
	20-ft. (6.1-m)	BC00604 **$13.95**		BC00204 **$15.95**	EYN600-0020-MM **$20.95**
	25-ft. (7.6-m)	BC00605 **$15.95**		BC00205 **$17.95**	
	Custom Lengths				EYN600-MM **$26.95 + $.74/ft.**
Centronics Female DB25 Male	6-ft. (1.8-m)				EYN600-0006-MF **$13.95**
	10-ft. (3.0-m)				EYN600-0010-MF **$16.95**
	20-ft. (6.1-m)				EYN600-0020-MF **$20.95**
	Custom Lengths				EYN600-MF **$26.95 + $.74/ft.**

Black Box Explains...

Serial and Parallel Connections.

Computer devices communicate in one of two modes: serial or parallel. In serial mode, the data stream is transmitted one bit at a time. In parallel mode, multiple bits are sent simultaneously. Generally, serial cables have DB9 connectors. Parallel cables have DB25 connectors.

PLUS! Interface Converters, see pp. 314–337.

Extra Distance up to 150 ft.
EQHYP4
ABSOLUTELY GUARANTEED FOR LIFE

PC Parallel and DB25 Hypercable

Parallel Transmission up to 150 Feet.

NOTE: The Hypercable operates from the voltage (+5 V) present on Pins 13, 14, 15, or 16 of the standard PC parallel interface.

- Electronic boosters in the connectors extend distances up to 150 feet (45.7 m) in parallel applications.
- Ideal for DX2 or faster workstations.
- Use PC Parallel Hypercable for printers with Centronics® connectors and switches with DB25 connectors.
- Use DB25 Hypercable for HP® LaserJet® printers and switches with DB25 connectors.

FAXBACK INFO
Request Document Number: 11031
Call 412-746-5500
Anytime

Item			Code	Price
PC Parallel Hypercable				
DB25 Male/Centronics Male	30-ft.	(9.1-m)	EQHYP4-0030	**$70.00**
	50-ft.	(15.2-m)	EQHYP4-0050	**$107.00**
	75-ft.	(22.9-m)	EQHYP4-0075	**$139.00**
	100-ft.	(30.5-m)	EQHYP4-0100	**$161.00**
	125-ft.	(38.1-m)	EQHYP4-0125	**$182.00**
	150-ft.	(45.7-m)	EQHYP4-0150	**$215.00**
DB25 Hypercable				
DB25 Male/DB25 Male	30-ft.	(9.1-m)	EQHYP5-0030	**$70.00**
	50-ft.	(15.2-m)	EQHYP5-0050	**$107.00**
	75-ft.	(22.9-m)	EQHYP5-0075	**$139.00**
	100-ft.	(30.5-m)	EQHYP5-0100	**$161.00**
	125-ft.	(38.1-m)	EQHYP5-0125	**$182.00**
	150-ft.	(45.7-m)	EQHYP5-0150	**$215.00**
DB25 Male/DB25 Female	30-ft.	(9.1-m)	EQHYP6-0030	**$70.00**
	50-ft.	(15.2-m)	EQHYP6-0050	**$107.00**
	75-ft.	(22.9-m)	EQHYP6-0075	**$139.00**
	100-ft.	(30.5-m)	EQHYP6-0100	**$161.00**
	125-ft.	(38.1-m)	EQHYP6-0125	**$182.00**
	150-ft.	(45.7-m)	EQHYP6-0150	**$215.00**

* * *

Enhanced Parallel Port Cable

Get Maximum Performance from Your High-Speed Parallel Port.

- **Designed for laser printers and parallel port adapters.**

IEEE-1284 Compliant
ABSOLUTELY GUARANTEED FOR LIFE

Top to bottom: DB25F, Centronics M, MDR 36M

The latest advance in printer technology, IEEE 1284, is finally here—high-speed, bidirectional parallel ports. So now you can send data to the printer ten or more times faster than before—but you need the right cables to do it.

That's where BLACK BOX® Enhanced Parallel Port Cables come in. They make it possible for you to get all the advantages you expect from your IEEE 1284-compliant devices: optimal throughput and two-way communications for detailed management and reporting.

SPECIFICATIONS

Attenuation — Less than 1.5 dB at 5 MHz
Unbalanced Impedance — 62 ± 6 ohms over the frequency band of 4 to 16 MHz
Interface — IEEE 1284 compliant

FAXBACK INFO
Request Document Number: 13428
Call 412-746-5500
Anytime

Item			Code	Price
Enhanced Parallel Port Cable				
DB25M/M Connectors	6-ft.	(1.8-m)	EQN200-0006	**$28.00**
	10-ft.	(3.0-m)	EQN200-0010	**$35.00**
	20-ft.	(6.1-m)	EQN200-0020	**$60.00**
	30-ft.	(9.1-m)	EQN200-0030	**$70.00**
DB25M/F Connectors	6-ft.	(1.8-m)	EQN201-0006	**$28.00**
	10-ft.	(3.0-m)	EQN201-0010	**$35.00**
	20-ft.	(6.1-m)	EQN201-0020	**$60.00**
	30-ft.	(9.1-m)	EQN201-0030	**$70.00**
DB25M/Centronics Connectors	6-ft.	(1.8-m)	EQN202-0006	**$30.00**
	10-ft.	(3.0-m)	EQN202-0010	**$37.00**
	20-ft.	(6.1-m)	EQN202-0020	**$62.00**
	30-ft.	(9.1-m)	EQN202-0030	**$72.00**
DB25M/MDR36M Connectors	6-ft.	(1.8-m)	EQN203-0006	**$48.00**
	10-ft.	(3.0-m)	EQN203-0010	**$55.00**
	20-ft.	(6.1-m)	EQN203-0020	**$80.00**
	30-ft.	(9.1-m)	EQN203-0030	**$90.00**
Centronics M/MDR36M Connectors				
	6-ft.	(1.8-m)	EQN204-0006	**$50.00**
	10-ft.	(3.0-m)	EQN204-0010	**$57.00**
	20-ft.	(6.1-m)	EQN204-0020	**$82.00**
	30-ft.	(9.1-m)	EQN204-0030	**$92.00**
MDR36M/MDR36M Connectors	6-ft.	(1.8-m)	EQN205-0006	**$68.00**
	10-ft.	(3.0-m)	EQN205-0010	**$75.00**
	20-ft.	(6.1-m)	EQN205-0020	**$100.00**
	30-ft.	(9.1-m)	EQN205-0030	**$110.00**

* * *

Flexi-Lite Cable

The Cabling Solution that Fits in Your Pocket.

Slimline 90° Connectors!

ABSOLUTELY GUARANTEED FOR LIFE

- **Slimline 90° connectors fit in tight spaces.**
- **Superflexible, lightweight—goes anywhere.**
- **Works with any PC—perfect for notebooks!**

Don't try pocketing other cables. Only the Flexi-Lite Cables from Black Box have the 90° slim-line connector for extreme flexibility. If you travel with a laptop computer or if your workstation is tight on space, our lightweight Flexi-Lite Cables save strain on your computer's connectors and make your life easier. DB9, DB25 serial, parallel printer, and AT® serial cables are available.

FAXBACK INFO
Request Document Number: 12661
Call 412-746-5500
Anytime

Item			Code	Price
Flexi-Lite Cable				
DB9 Serial M/M	6-ft.	(1.8-m)	EQN300-0006	**$14.95**
	12-ft.	(3.7-m)	EQN300-0012	**$17.95**
DB9 Serial M/F	6-ft.	(1.8-m)	EQN301-0006	**$14.95**
	12-ft.	(3.7-m)	EQN301-0012	**$17.95**
DB9F to DB25M	6-ft.	(1.8-m)	EQN302-0006	**$14.95**
	12-ft.	(3.7-m)	EQN302-0012	**$17.95**
DB9M to DB25F	6-ft.	(1.8-m)	EQN303-0006	**$14.95**
	12-ft.	(3.7-m)	EQN303-0012	**$17.95**
DB25 Serial M/F	6-ft.	(1.8-m)	EQN304-0006	**$15.95**
	12-ft.	(3.7-m)	EQN304-0012	**$18.95**
DB25 Serial M/M	6-ft.	(1.8-m)	EQN305-0006	**$15.95**
	12-ft.	(3.7-m)	EQN305-0012	**$18.95**
Parallel Printer	6-ft.	(1.8-m)	EQN306-0006	**$16.95**
	12-ft.	(3.7-m)	EQN306-0012	**$21.95**

Serial Printer Cable

Connect Your PC or AT to a Serial Printer.

ABSOLUTELY GUARANTEED FOR LIFE

GOOD
BC00901
BC00801

BEST
EVMBPC

PC/XT Serial Printer Cable

(BC00901 Series)
DB25M/DB25F

- Connects your PC/XT™ (DB25 serial port) to a serial printer.
- Fully molded hoods with thumbscrews.
- 7-conductor configuration.
- 28 AWG foil-shielded construction.

AT Serial Printer

(BC00801 Series)
DB25M/DB9F

- Connects your AT® computer (DB9 serial port) to a serial printer.
- Fully molded hoods with thumbscrews.
- 7-conductor configuration.
- 28 AWG foil-shielded construction.

AT Serial Printer (CL2)

(EVMBPC Series)
DB25M/DB9F

- Connects your AT computer to a serial printer.
- Features non-molded assemblies with removable hoods and crimped contacts for convenient repinning.
- 7-conductor, paired configuration.
- 24 AWG foil-shielded construction with drain wire.

PLUS! Parallel Printer Cables, see pp. 106–107.

BUYER'S GUIDE

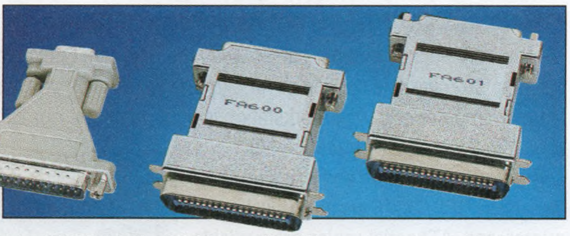
SERIAL PRINTER CABLES

Cable Connectors	PC/XT™ Style DB25 Male / DB25 Female	AT® Style DB25 Male	DB9 Female
Lengths	GOOD	GOOD	BEST
6-ft. (1.8-m)	BC00901 $6.95	BC00801 $6.95	EVMBPC-0006 $8.95
10-ft. (3.0-m)	BC00902 $9.95	BC00802 $9.95	EVMBPC-0010 $11.95
15-ft. (4.6-m)	BC00903 $11.95	BC00803 $11.95	
20-ft. (6.1-m)	BC00904 $13.95		
25-ft. (7.6-m)	BC00905 $15.95		EVMBPC-0025 $17.95
50-ft. (15.2-m)			EVMBPC-0050 $27.95
Custom Lengths			EVMBPC $8.95 + $.44/ft.

Serial AT and Parallel PC Adapters

Handy Plug-In Alternatives to Special IBM® AT and PC Connector Cables.

Item	Code	Price
AT Adapter (Serial)		
DB9 Female to DB25 Male	FA520A-R2	$11.95
DB9 Male to DB25 Female	FA521A	$10.95
PC Adapter (Parallel)		
DB25 Male to Centronics Male	FA600	$11.95
DB25 Female centronics Male	FA601	$11.95



AT Adapter (FA520A-R2) *PC Adapter (FA600)* *PC Adapter (FA601)*

PC/AT Modem Cables Connect Your Async Modem.

- Use these cables to connect your IBM® AT® or PC or compatible to asynchronous modems of any speed.
- AT modem cables have DB9F and DB25M connectors.
- PC modem cables have DB25M and DB25F connectors.

GOOD
BC00301

BEST
EVMBSM

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Standard Modem Cables

- Fully molded hoods with thumbscrews for easy connection.
- Aluminum foil shield for quiet environments.
- 10-conductor configuration, 28 AWG.

Premium Modem Cables

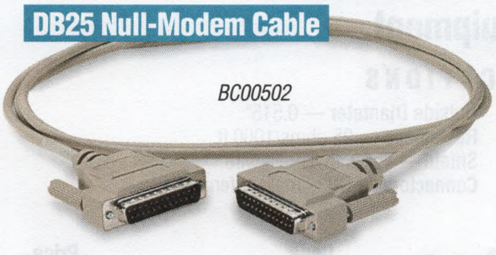
- Non-molded assemblies with removable hoods for easy repinning.
- Braided shield and drain wire for noisy environments.
- 25-conductor configuration, 24 AWG with drain wire.

Item	Code	Price
AT Modem Cable, Standard, DB9F/DB25M		
6-ft. (1.8-m)	BC00301	**$12.95**
10-ft. (3.0-m)	BC00302	**$14.95**
PC Modem Cable, Standard, DB25M/DB25F		
6-ft. (1.8-m)	BC00401	**$12.95**
10-ft. (3.0-m)	BC00402	**$14.95**

Item	Code	Price
AT Modem Cable, Premium, DB9F/DB25M		
6-ft. (1.8-m)	EVMBMC-0006	**$17.95**
10-ft. (3.0-m)	EVMBMC-0010	**$19.95**
25-ft. (7.6-m)	EVMBMC-0025	**$23.95**
50-ft. (15.2-m)	EVMBMC-0050	**$30.95**
Custom Lengths	EVNBMC	**$16.15 + $.44/ft.**
PC Modem Cable, Premium, DB25M/DB25F		
6-ft. (1.8-m)	EVMBSM-0006	NEW LOW PRICE! $ **$21.95**
10-ft. (3.0-m)	EVMBSM-0010	**$25.95**
25-ft. (7.6-m)	EVMBSM-0025	**$37.95**
50-ft. (15.2-m)	EVMBSM-0050	**$56.95**
Custom Lengths	EVNBSM	**$21.55 + $.76/ft.**

MORE! Null Modem Cables, **see p. 111.**

DB25 Null-Modem Cable Connect Two Serial Devices Configured as DTEs or DCE Async Only.



- Connect computer to computer for file transfer through serial port.
- Cross-pinning.
- Can be used for hardware flow-control or X-ON/X-OFF applications.

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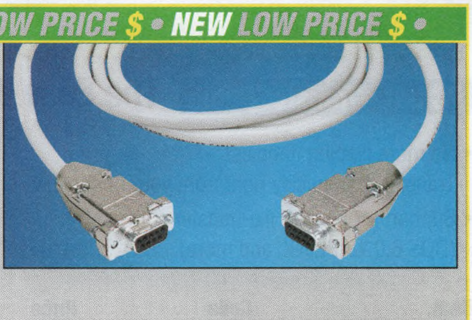
Item	Code	Price
DB25 Null-Modem Cable, DB25F/DB25F		
6-ft. (1.8-m)	BC00501	**$12.95**
10-ft. (3.0-m)	BC00503	**$14.95**
15-ft. (4.6-m)	BC00505	**$17.95**
20-ft. (6.1-m)	BC00507	**$21.95**
25-ft. (7.6-m)	BC00509	**$24.95**

Item	Code	Price
DB25 Null-Modem Cable, DB25M/DB25M		
6-ft. (1.8-m)	BC00502	**$12.95**
10-ft. (3.0-m)	BC00504	**$14.95**
15-ft. (4.6-m)	BC00506	**$17.95**
20-ft. (6.1-m)	BC00508	**$21.95**
25-ft. (7.6-m)	BC00510	**$24.95**

• NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ •

IBM AT-AT Null-Modem Cable Download Files Quickly and Easily between AT Computers.

- **Ideal for AT to AT file transfers.**
- **No more flipping floppies.**
- **Perfect for the DOS 6.0 file-transfer utility.**



Need to transfer files between your AT computers? This Cable is the answer. Just attach it between your AT serial ports and you're ready to transfer data.

The Cable crosses Pins 2 and 3 so data is sent and received in compliance with the RS-232 communications standards.

Item	Code	Was	NOW!
IBM AT-AT Null-Modem Cable, DB9F/DB9F			
6-ft. (1.8-m)	EYN257H-0006-FF	~~$24.95~~	**$21.95**
10-ft. (3.0-m)	EYN257H-0010-FF	~~$26.95~~	**$23.95**
15-ft. (4.6-m)	EYN257H-0015-FF	~~$28.95~~	**$25.95**

Item	Code	Was	NOW!
IBM AT-AT Null-Modem Cable, DB9F/DB9F			
25-ft. (7.6-m)	EYN257H-0025-FF	~~$32.95~~	**$28.95**
50-ft. (3.0-m)	EYN257H-0050-FF	~~$42.95~~	**$37.95**
Custom Lengths	EYN257H		**$21.55 + $.33/ft.**

Universal Serial Bus (USB) Cable

They're Here—Cables for Your Universal Serial Bus!

New

Type A
Type B

A Type A connector on one end and a Type B connector on the other prevents accidental loops.

- Super simplicity! End the port shortage with new Universal Serial Bus technology.
- Make plug-and-play connections with keyboards, mice, hubs, printers, etc.
- Fully rated USB 12-Mbps speeds.
- Cables feature Type A to Type B plugs.
- Transfer asynchronous and isochronous data.
- Put 5 meters between your bus devices.
- Shielded, 28-AWG twisted-pair construction meets the rated speed of 12 Mbps.

Item	Code	Price
Universal Serial Bus (USB) Cable		
3-ft. (0.9-m)	USB01-0003	**$11.95**
6-ft. (1.8-m)	USB01-0006	**$13.95**
10-ft. (3.0-m)	USB01-0010	**$17.95**
15-ft. (4.6-m)	USB01-0015	**$21.95**

Black Box Explains...

USB (Universal Serial Bus).

Universal Serial Bus (USB) is a royalty-free bus specification developed by leading manufacturers in the PC and telephony industries to support Plug-and-Play peripheral connections. USB offers increased bandwidth, isochronous and asynchronous data transfers, and lower costs than conventional I/O ports.

The USB Bus is a daisychain consisting of USB hubs and peripherals less than 5 meters apart. The USB daisychain can support up to 127 devices. Instead of opening up the CPU to insert new boards, the user makes all connections *outside* the case to the USB port(s).

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DB15 Thumbscrew Cable

Error-Free Transmission for Texas Instruments® and NCR® POS Computers.

Item	Code	Code	Code	Price
DB15 Thumbscrew Cable				
	Female/Female	*Male/Female*	*Male/Male*	
2-ft. (0.6-m)	EGM16E-0002-FF	EGM16E-0002-MF	EGM16E-0002-MM	**$21.95**
5-ft. (1.5-m)	EGM16E-0005-FF	EGM16E-0005-MF	EGM16E-0005-MM	**$22.95**
10-ft. (3.0-m)	EGM16E-0010-FF	EGM16E-0010-MF	EGM16E-0010-MM	**$25.95**
15-ft. (4.6-m)	EGM16E-0015-FF	EGM16E-0015-MF	EGM16E-0015-MM	**$29.95**
20-ft. (6.1-m)	EGM16E-0020-FF	EGM16E-0020-MF	EGM16E-0020-MM	**$32.95**
25-ft. (7.6-m)	EGM16E-0025-FF	EGM16E-0025-MF	EGM16E-0025-MM	**$35.95**
35-ft. (10.7-m)	EGM16E-0035-FF	EGM16E-0035-MF	EGM16E-0035-MM	**$41.95**
50-ft. (15.2-m)	EGM16E-0050-FF	EGM16E-0050-MF	EGM16E-0050-MM	**$51.95**
Custom Lengths	EGN16E-FF	EGN16E-MF	EGN16E-MM	**$21.95 + $.93/ft.**

- EMI/RFI hoods with thumbscrews.
- Shielded cable with drain wire.

ABSOLUTELY GUARANTEED FOR LIFE

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DB37 Interface Cable

Specially Designed for RS-422/485/449 Equipment.

- Terminated with RS-449 (DB37) crimp connectors.
- Use with all your RS-449 devices.

ABSOLUTELY GUARANTEED FOR LIFE

SPECIFICATIONS

Cable Construction — Gray PVC
Conductor Gauge — 24 AWG (7 x 32)
Hoods — Black plastic
Maximum Distance — Per equipment specifications
Mutual Capacitance — 12 pF/ft. ± 2 pF/ft.
Outside Diameter — 0.515"
Resistance — 25 ohms/1000 ft.
Shield — Foil with a drain wire
Connectors — DB37 male or female

Item	Code	Code	Code	Price
DB37 Interface Cable				
	Female/Female	*Male/Female*	*Male/Male*	
5-ft. (1.5-m)	EDN37J-0005-FF	EDN37J-0005-MF	EDN37J-0005-MM	**$38.95**
10-ft. (3.0-m)	EDN37J-0010-FF	EDN37J-0010-MF	EDN37J-0010-MM	**$43.95**
15-ft. (4.6-m)	EDN37J-0015-FF	EDN37J-0015-MF	EDN37J-0015-MM	**$48.95**
20-ft. (6.1-m)	EDN37J-0020-FF	EDN37J-0020-MF	EDN37J-0020-MM	**$53.95**
25-ft. (7.6-m)	EDN37J-0025-FF	EDN37J-0025-MF	EDN37J-0025-MM	**$58.95**
50-ft. (15.2-m)	EDN37J-0050-FF	EDN37J-0050-MF	EDN37J-0050-MM	**$85.95**
Custom Lengths	EDN37J-FF	EDN37J-MF	EDN37J-MM	**$33.40 + $1.13/ft.**

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PC Data-Transfer Cable

The Easy Way to Transfer Data from Your Laptop or Notebook.

- No more flipping floppies! Transfer data quickly right from your portable.
- Support for popular file-transfer software (DOS 6.0, LAPLINK, and more).

ABSOLUTELY GUARANTEED FOR LIFE

BC01801
BC01802

Item	Code	Price
PC Data-Transfer Cable		
Parallel (DB25M/M)		
6-ft. (1.8-m)	BC01801	**$11.95**
Universal Serial (DB25F/DB9F to DB25F/DB9F)		
6-ft. (1.8-m)	BC01802	**$15.95**

FAXBACK INFORMATION
Request Document Number: 13411
Call 412-746-5500 Anytime

Tail-Circuit Cable • Null-Modem Cable

Run Data Short Distances without Line Drivers!

- Great for short transmissions of 50 to 100 feet (15 to 30 m).
- Cross-pinned—these cables cross the proper signals for DCE-to-DCE (tail-circuit) or DTE-to-DTE (null-modem) connections.
- Eliminate line drivers and modems.

SPECIFICATIONS

Cable Construction — Gray PVC
Conductor Gauge — EYN250: 22 AWG (7 x 30); All other models: 24 AWG (7 x 32)
Mutual Capacitance — EYN250: 50 pF/ft.; All other models: 12 pF/ft. ± 2 pF/ft.
Resistance — EYN250: Less than 16 ohms/1000 ft.; All other models: 25 ohms/1000 ft.
Shield — EYN250: None; All other models: Foil with a drain wire
Connectors — DB25, V.35

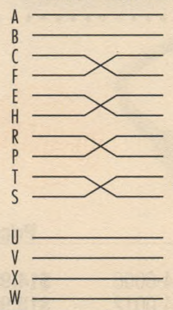
Please specify gender and length when ordering.

Item	Code	Price
Tail-Circuit Cable		
V.35	EYN452	**$53.95 + $.57/ft.**
RS-232	EYN255C	**$20.95 + $.57/ft.**
Null-Modem Cable (Unshielded)		
5-ft. (1.5-m)	EYN250-0005	**$17.95**
10-ft. (3.0-m)	EYN250-0010	**$19.95**
20-ft. (6.1-m)	EYN250-0020	**$21.95**
25-ft. (7.6-m)	EYN250-0025	**$22.95**
50-ft. (15.2-m)	EYN250-0050	**$27.95**
Custom Lengths	EYN250C	**$21.55 + $.27/ft.**
Extended Distance Null-Modem Cable (Foil Shielded with Drain Wire)		
5-ft. (1.5-m)	EYN251-0005	**$18.95**
10-ft. (3.0-m)	EYN251-0010	**$19.95**
25-ft. (7.6-m)	EYN251-0025	**$25.95**
50-ft. (15.2-m)	EYN251-0050	**$33.95**
75-ft. (22.9-m)	EYN251-0075	**$41.95**
100-ft. (30.5-m)	EYN251-0100	**$50.95**
Custom Lengths	EYN251C	**$21.55 + $.43/ft.**
Specialty Cross-Pinned Cable (See Pin-Outs below)		
I	EYN253C	**$20.95 + $.57/ft.**
II	EYN254C	**$20.95 + $.43/ft.**
III	EYN256C	**$20.95 + $.43/ft.**

EYN452
EYN250
EYN251
EYN253
ABSOLUTELY
GUARANTEED
FOR LIFE

Black Box Explains: Pinning Charts for DB25 Connectors.

V.35 Tail-Circuit Cable—EYN452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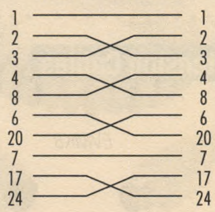
RS-232 Tail-Circuit Cable—EYN255C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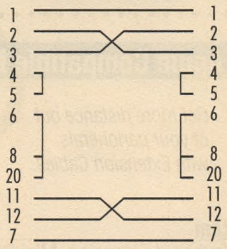
Null-Modem Cable—EYN250, EYN251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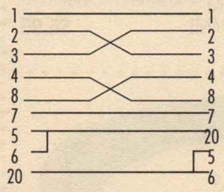
Specialty Cross-Pinned Cable I—EYN253C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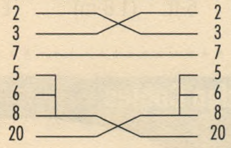
Specialty Cross-Pinned Cable II—EYN254C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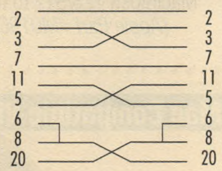
Specialty Cross-Pinned Cable III—EYN256C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AME (Asynchronous Modem Eliminator)

Simple Cross-Pinning Adapters for Your Local Async Data Transfer.

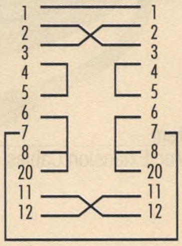
ME200
CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!

- Ensures that all async cables have the same pinning.
- Comes in any combination of DB25 male and female connectors.
- Both Ready Paks come with one RS-232 Cable (25-Conductor, Male/Male) (ECM25C-0005-MM).

Black Box Explains...

Pinning for AME Adapters.

Standard Pinning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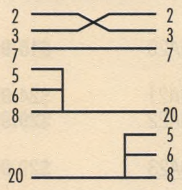
Special Pinning F/F Model ME210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SPECIFICATIONS

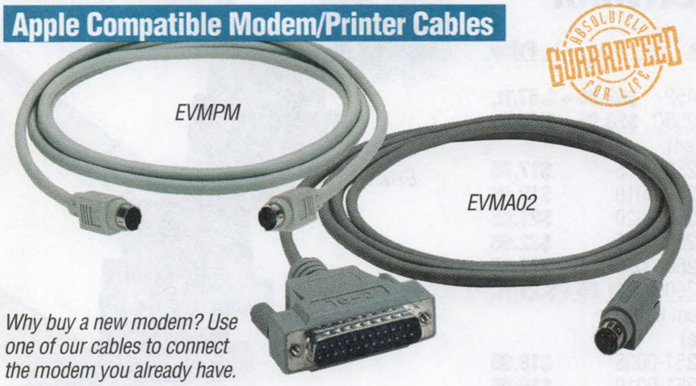
Operation — Transparent
Protocol — Asynchronous
Speed — Transparent
Interface — RS-232
Connectors — (2) DB25 (specify genders)
Power — None required
Size — 0.5"H x 2.3"W x 2.1"D (1.3 x 5.8 x 5.3 cm)
Weight — 0.3 lb. (0.1 kg)

Item		Code	Price
AME	F/F	ME200	**$14.95**
	Ready Pak includes: the AME **plus** (**1**) 5-ft. RS-232 Cable	ME200-CABPAK	**$35.90**
	M/M	ME201	**$14.95**
	M/F	ME202	**$14.95**
	Ready Pak includes: the AME **plus** (**1**) 5-ft. RS-232 Cable	ME202-CABPAK	**$35.90**
	F/F (with Special Pinning)	ME210	**$14.95**

For an async modem eliminator and RS-232 cable in one, see Null-Modem Cables above and on page 109.

Call Black Box when You Need

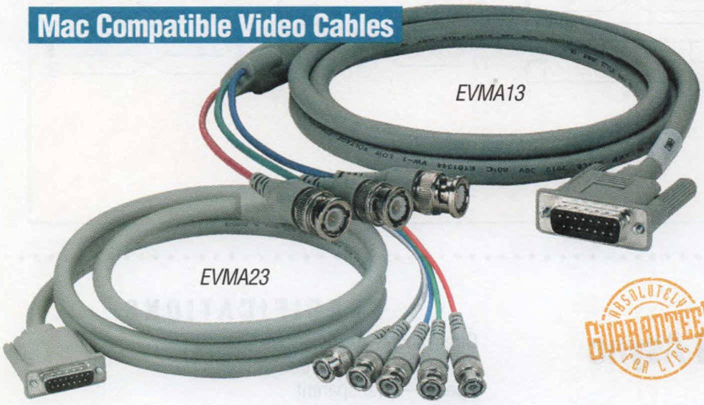
Apple Compatible Modem/Printer Cables



Why buy a new modem? Use one of our cables to connect the modem you already have.

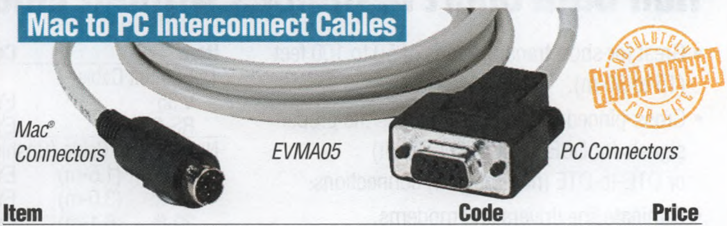
Item		Code	Price
High-Speed Modem Cables, Mini DIN 8M-DB25			
	6-ft. (1.8-m)	EVMAI	$10.95
	10-ft. (3.0-m)	EVMAI-0010	$15.95
Personal Modem Cables, Mini DIN 8M-M			
(Apple Part #M0197)	6-ft. (1.8-m)	EVMPM	$10.95
	10-ft. (3.0-m)	EVMPM-0010	$14.95
Apple IIc to ImageWriter II Cables, LQ, Personal Modem, DIN 5M-MD8M			
	6-ft. (1.8-m)	EVMIM	$9.95
ImageWriter® Cables			
Macintosh® to ImageWriter I, Serial Printer (Lock-In), MD8M-DB25M			
(Apple Part #M0197)	6-ft. (1.8-m)	EVMA02-0006	$23.95
	10-ft. (3.0-m)	EVMA02-0010	$26.95
Apple IIe w/Superserial to ImageWriter II, LQ Printer (Lock-In),			
(Apple #A2C9313)	6-ft. (1.8-m)	EVMA03-0006	$27.95
Macintosh 128/512 to ImageWriter II, LQ-DB9M-MD8M			
(Apple Part #M0196)	6-ft. (1.8-m)	EVMMI	$6.95

Mac Compatible Video Cables



Item		Code	Price
Video Cables			
DB15M-3 BNC	6-ft. (1.8-m)	EVMA13	$44.95
DB15M-DB15M	6-ft. (1.8-m)	EVMA14	$11.95
DB15M-DB15M	12-ft. (3.7-m)	EVMA15	$13.95
DB15M-DB15F	6-ft. (1.8-m)	EVMA16	$11.95
DB15M-4 BNC	6-ft. (1.8-m)	EYRGBS3-0006	$49.95
Video Adapters and Cables			
DB15 Male to HD15 Female Adapter w/Thumbscrews		EVMA20	$15.95
HD15 Female to HD15 Female Power Mac® Cable	6-in. (15.2-cm)	EVMA21	$24.95
DB15 Male to HD15 Female Power Mac Adapter		EVMA22	$29.95
DB15 Male to (5) BNC Mac Video Cable	6-ft. (1.8-m)	EVMA23	$29.95
Gender Changers, HD15, EMI/RFI Shielded			
Male		FA452	$14.95
Female		FA454	$14.95

Mac to PC Interconnect Cables



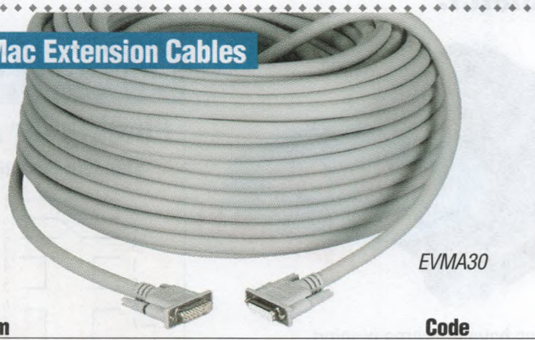
Item		Code	Price
Serial Cables			
Macintosh Serial to IBM AT® Serial			
MD8M-DB9F	6-ft. (1.8-m)	EVMA05-0006	$39.00
	10-ft. (3.0-m)	EVMA05-0010	$40.00
	Custom Lengths	EVMA05	$39.00 + $.30/ft.
Macintosh Serial to IBM XT™ Serial			
MD8M-DB25F	6-ft. (1.8-m)	EVMA06-0006	$43.00
	10-ft. (3.0-m)	EVMA06-0010	$44.00
	Custom Lengths	EVMA06	$43.00 + $.30/ft.
LaserJet® Cables			
Macintosh® to HP® LaserJet			
MD8M-DB25M	6-ft. (1.8-m)	EVMA07-0006	$14.95
	10-ft. (3.0-m)	EVMA07-0010	$18.95
	Custom Lengths	EVMA07	$17.95 + $.30/ft.
ImageWriter Cables			
IBM AT to ImageWriter or LaserWriter®			
MD8M-DB9F	6-ft. (1.8-m)	EVMA08-0006	$39.00
	10-ft. (3.0-m)	EVMA08-0010	$44.00
	Custom Lengths	EVMA08	$39.00 + $.30/ft.
IBM XT to ImageWriter or LaserWriter			
MD8M-DB25F	6-ft. (1.8-m)	EVMA09-0006	$43.00
	10-ft. (3.0-m)	EVMA09-0010	$44.00
	Custom Lengths	EVMA09	$43.00 + $.30/ft.

Apple Compatible Extension Cables

Get more distance out of your peripherals with Extension Cables.

Item		Code	Price
Keyboard Extension, Mini DIN 4, ADB Extension Cables			
Male/Female	6-ft. (1.8-m)	EVMK4-0006	$14.95
	12-ft. (3.7-m)	EVMK4-0012	$18.95
Male/Male	6-ft. (1.8-m)	EVMK4B-0006-MM	$14.95
	10-ft. (3.0-m)	EVMK4B-0010-MM	$18.95
Switch Box Cable, Mini DIN 8M-M Straight-Through			
Male/Male	6-ft. (1.8-m)	EVMK8-0006-MM	$22.95
Extension Cable Mini DIN 8, Coiled (Extends Existing Mini DIN 8)			
Male/Female	6-ft. (1.8-m)	EVMK8-0006-MF	$17.95

Mac Extension Cables



Item		Code	Price
Mac Extension Cables, DB15M/F			
	30-ft. (9.1-m)	EVMA30	$55.95
	50-ft. (15.2-m)	EVMA50	$99.95
	100-ft. (30.0-m)	EVMA100	$149.95
	150-ft. (45.7-m)	EVMA150	$239.95
	250-ft. (15.2-m)	EVMA250	$379.95

Cables for Your Apple and Mac!

Apple Compatible SCSI Cables

Set Up Your Apple SCSI Bus with Black Box.

EVMS12-0006
ABSOLUTELY GUARANTEED FOR LIFE

- Double shielded: foil and braid.
- Constructed of 19 twisted-pair wire, 26 AWG.

Item	Code	Price
Apple® Compatible SCSI Cables		
DB25 Male to DB25 Female w/Thumbscrews		
6.0-ft. (1.8-m)	EVMS12-0006	**$19.95**
DB25 Male to DB25 Male w/Thumbscrews		
2.0-ft. (0.6-m)	EVMS13-0002	**$12.95**
C50 Male to C50 Male w/Bail Locks		
1.5-ft. (0.4-m)	EVMS14-0002	**$14.95**
3.0-ft. (0.9-m)	EVMS14-0003	**$19.95**
6.0-ft. (1.8-m)	EVMS14-0006	**$24.95**
C50 Male to C50 Female w/Bail Locks		
2.0-ft. (0.6-m)	EVMS15-0002	**$19.95**
6.0-ft. (1.8-m)	EVMS15-0006	**$29.95**
Micro D50 Male to Male w/Thumbclips		
3.0-ft. (0.9-m)	EVMS17-0003	**$39.95**
6.0-ft. (1.8-m)	EVMS17-0006	**$49.95**
Micro D50 Male to DB25 Male		
3.0-ft. (0.9-m)	EVMS18-0003	**$39.95**

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PowerBook Transition Cables

Connect Your PowerBook to Disk Drives and Docking Stations.

EVMA10
ABSOLUTELY GUARANTEED FOR LIFE

FAXBACK INFO
Request Document Number: 15059
Call 412-746-5500
Anytime

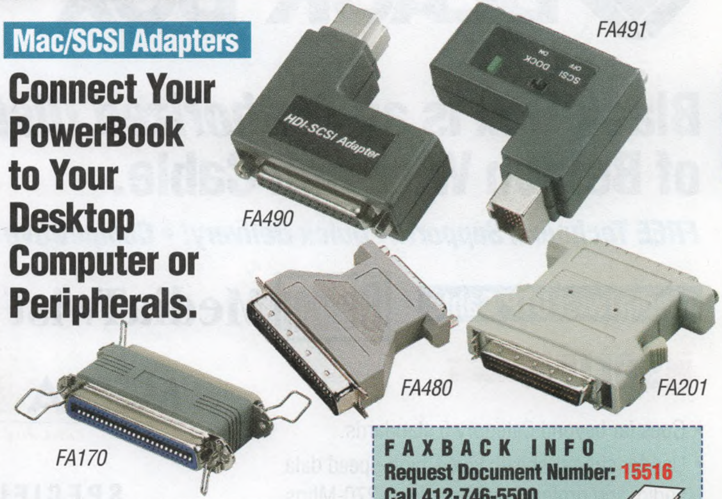
Item	Code	Price
PowerBook Transition Cables		
Disc Adapter (HDI30M-DB25M)		
18-in. (45.7-cm)	EVMA10	**$39.95**
SCSI (HDI30M-C50M) 18-in. (45.7-cm)	EVMA11	**$39.95**
Docking (HDI30M-C50F) 18-in. (45.7-cm)	EVMA12	**$39.95**

VIPreview
Ask for our
SCSI Bus VIPreview.

PLUS!
SCSI Cables,
see pp. 96–101.

Mac/SCSI Adapters

Connect Your PowerBook to Your Desktop Computer or Peripherals.



FAXBACK INFO
Request Document Number: 15516
Call 412-746-5500
Anytime

- Dock Adapters feature a green LED and a 2-position slide switch.

Item	Code	Price
Mac®/SCSI Adapters		
HDI130 Male to DB25 Female	FA490	**$27.95**
to DB25 Female SCSI/Dock	FA491	**$39.95**
to C50 Female Adapter	FA492	**$34.95**
to C50 Female SCSI/Dock	FA493	**$39.95**
C50 Male to DB25 Female	FA480	**$16.00**
C50 Female to DB25 Male	FA481	**$20.00**
MD50 Male to DB25 Female	FA201	**$22.95**
MD50 Female to DB25 Male	FA202	**$22.95**
C50 Female to Female	FA170	**$15.95**
MD50 Female to Female	FA173	**$31.95**

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Mac Compatible Power Cords

Top-Quality Power Cords for Your Mac.

EPWR10
ABSOLUTELY GUARANTEED FOR LIFE

Item	Code	Price
Mac Compatible Power Cords, 6-ft.(1.8-m)		
Replacement Power Cord	EPWR10	**$9.95**
Power Cord Extension	EPWR11	**$9.95**

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Peripheral Adapters

Connect Your Apple or Mac to Apple Peripherals.

EVMA01
ABSOLUTELY GUARANTEED FOR LIFE

Item		Code	Price
Peripheral Adapter, MD8M-DB9F (Lock-In), Not Pinned to IBM® Pinning (Serial)			
(Apple Part #M0199)	1-ft. (0.3-m)	EVMA01	**$19.95**
Apple IIGS® Superserial Card Adapter			
(Apple Part #A9M0333)	1-ft. (0.3-m)	EVMA04	**$26.95**
2-Position Mini DIN 8 Switch Cable	6-ft. (1.8-m)	EVMA19	**$54.95**
ADB Port Extender	6-ft. (1.8-m)	EVMA18	**$14.95**

BLACK BOX® + Belden = the best!

Black Box Is an *Authorized Distributor* of Belden Wire and Cable.

FREE Technical Support! • Quick Delivery! • Competitive Pricing!

FAXBACK INFORMATION
For All Belden Cables on this Page: 18698
Call 412-746-5500 Anytime

MediaTwist UTP Cable

Belden MediaTwist™ 350—A True Multimedia Cable!

SOLID

MEDIA TWIST
CABLE WITH CONFIDENCE

- Goes far beyond Category 5 standards.
- Use for shared-sheath voice, high-speed data, audio, and professional-broadcast 270-Mbps digital video applications.
- Unique patent-pending design and process produces an extremely stable cable with improved electrical performance.
- Unique crescent-shaped design—each pair is "locked" into place. No matter how much cable is twisted during installation, the cable performs.
- Exceptional ACR (attenuation to crosstalk ratio).
- Offers additional headroom for future growth.

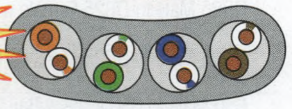
SPECIFICATIONS

Cable Construction — 1872A: PVC; polyolefin insulated PVC jacket;
1874A: Plenum, FEP Teflon® and polyolefin insulated Flamarrest® jacket
Cable Type — 4-pair solid, copper UTP
Conductor Gauge — 24 AWG
Frequency — Up to 350 MHz
Impedance — Up to 100 ± 12%
Nominal Capacitance — 15 pF/ft.
Maximum Conductor — 27.4 ohms/1000 ft.
Standards — EIA/TIA 568-A Category 5
Weight/ — 1872A: 29 lb./1000 ft. (13.2 kg/100 m);
1874A: 31 lb./1000 ft. (14 kg/100 m)

1872

New

New Design!



Item		Code	Price
MediaTwist UTP Cable, Solid, 4-Pr, 1000-ft. (304.8-m)			
PVC NEC® CM	Gray	1872A-F6H-A1000	$195.95
	Blue	1872A-6-A1000	$195.95
Plenum NEC® CMP			
	Gray	1874A-877-A1000	$569.95
	Blue	1874A-D15-A1000	$569.95

DataTwist 350 UTP Cable

Belden DataTwist® 350 Superior 350-MHz UTP Cables.

SOLID **STRANDED**

- Unique, patent-pending design and process.
- Offers stable electrical performance at 350 MHz, more than triple the verified range of the EIA/TIA 568-A Category 5 standard.
- UL® listed/CSA approved.
- Easy to terminate, includes stripper.
- Offers much greater performance in key areas: capacitance, frequency, resistance, attenuation, NEXT, and impedance.

New

SPECIFICATIONS

Cable Construction — 1700A, 1752A: PVC;
1701A: FEP Teflon
Cable Type — 4-pair solid or stranded copper UTP
Conductor Gauge — 24 AWG
Frequency — Up to 350 MHz
Impedance — 100 ± 22%
Nominal Capacitance — 14 pF/ft.
Standards — EIA/TIA 568-A Category 5
Weight — 1700A: 27.6 lb./1000 ft. (4.2 kg/100 m);
1701A: 25.1 lb./1000 ft. (3.8 kg/100 m);
1752A: 21.1 lb./1000 ft. (3.2 kg/100 m)

ABSOLUTELY GUARANTEED FOR LIFE

Enhanced CAT5™

1700A

Item		Code	Price
DataTwist 350 UTP Cable, Solid, 4-Pair, 1000-ft. (304.8-m)			
PVC NEC® CM			
	Gray	1700A-Gray	$189.95
	Blue	1700A-Blue	$189.95
Plenum NEC® CMP			
	Natural	1701A-Gray	$395.95
	Blue	1701A-Blue	$395.95

Item	Gray	Red	Orange	Yellow	Green	Lt. Blue	Violet	Price
DataTwist 350 Patch Cable, Stranded, 4-Pair, 100-Ohm, NEC®, CM								
PVC 1000-ft. (304.8-m)	1752A-1000-F2	1752A-1000-2	1752A-1000-3	1752A-1000-4	1752A-1000-5	1752A-1000-6	1752A-1000-7	$229.95

DataTwist 5 UTP Cable

Belden DataTwist® 5 Superior 100-MHz UTP Cables.

SOLID

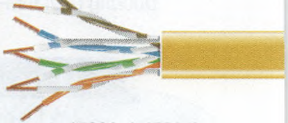
CAT5™

ABSOLUTELY GUARANTEED FOR LIFE

SPECIFICATIONS

Cable Construction — 1583A: PVC;
1585A: FEP Teflon (plenum)
Cable Type — Solid copper UTP
Conductor Gauge — 24 AWG
Frequency — Up to 100 MHz
Impedance — 100 ± 15 ohms
Nominal Capacitance — 15 pF/ft.
Standards — EIA/TIA 568-A Category 5
Weight — 1583A: 14.8 lb./1000 ft. (2.2 kg/100 m);
1585A: 27.9 lb./1000 ft. (4.2 kg/100 m)

New



1583A-4-1000-A

Item	Red	Yellow	Green	Blue	Beige	White	Price
DataTwist 5 UTP Cable, Solid, 4-Pair, Boxed, 1000-ft. (304.8-m)							
PVC	1583A-2-1000-A	1583A-4-1000-A	1583A-5-1000-A	1583A-6-1000-A	1583A-F6H-1000-A	—	$139.95
Plenum	—	—	—	1585A-D15-1000-A	—	1585A-877-1000-A	$269.95

CAT5 Bulk Cable

Color-Coded CAT5™ Bulk Cable. In Stock and Ready to Ship!

Convenient box dispenser makes installation easier than ever for CAT5 Solid Cable. (EYN737A-B, EYN739A-B—EYN742A-B)

SOLID

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ABSOLUTELY GUARANTEED FOR LIFE

MORE! CAT5 Cable, see pp. 68–69.

- UL® listed/CSA approved.
- ETL verified to TIA 568 TSB 40A specifications.
- Constructed of solid or stranded 24 AWG wire.
- Low attenuation and near-end crosstalk (NEXT) for your 100-MHz applications.
- Capacitance is 14 pF/ft.
- Impedance is 100±15 ohms.

FAXBACK INFORMATION
Request Document Number: 12609
Call 412-746-5500 Anytime

NOTE: Cable comes on spools unless otherwise noted.

Item	Jacket	Conductor	Length	Beige	Blue	Green	Red	Yellow	Price
Bulk CAT5 Cable									
2-Pair	PVC	Solid	500-ft. (152-m)	EYN717A-0500					$73.00
			1000-ft. (304-m)	EYN717A-1000					$147.00
			Custom Lengths	EYN717A					$.15/ft.
	Plenum	Solid	500-ft. (152-m)	EYN718A-0500					$115.00
			1000-ft. (304-m)	EYN718A-1000					$223.00
			Custom Lengths	EYN718A					$.25/ft.
4-Pair	PVC	Solid	500-ft. (152-m)	EYN737A-0500					$79.95
			1000-ft. (300-m)	EYN737A-1000	EYN739A-R	EYN740A-R	EYN741A-R	EYN742A-R	$135.00
			1000-ft. (Box) (300-m)	EYN737A-B	EYN739A-B	EYN740A-B	EYN741A-B	EYN742A-B	$135.00
			Custom Lengths	EYN737A					$.17/ft.
	Plenum	Solid	500-ft. (152-m)	EYN738A-0500					$154.95
			1000-ft. (300-m)	EYN738A-1000					$299.95
			Custom Lengths	EYN738A					$.34/ft.
	PVC	Stranded	250-ft. (76-m)	EVNSL05A-0250	EVNSL01A-0250	EVNSL02A-0250	EVNSL03A-0250	EVNSL04A-0250	$54.95
			500-ft. (152-m)	EVNSL05A-0500	EVNSL01A-0500	EVNSL02A-0500	EVNSL03A-0500	EVNSL04A-0500	$99.95
CAT5 Shielded Bulk Cable									
	PVC	Stranded	500-ft. (152-m)	EVMSL06A-0500					$229.95
		Solid	1000-ft. (300-m)	EVNSL70A-1000					$259.95
	Plenum	Solid	1000-ft. (300-m)	EVNSL71A-1000					$579.95

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Fast CAT5 Enhanced Bulk Cable

SOLID

Data Races up to 155 Mbps on Fast CAT5!

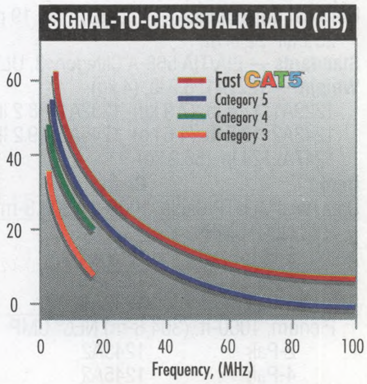
- **Exceeds the Category 5 specifications for near-end crosstalk (NEXT) by 14 dB.**
- **10–15% attenuation improvement.**

When you put your data on Fast CAT5, you and your high-speed applications come out winners!

That's because Fast CAT5 Cable is designed for high speeds. It supports both 100-Mbps Fast Ethernet and 155-Mbps ATM. And it's built for the future, too. Fast CAT5 exceeds today's Category 5 standards for Near-End Crosstalk.

Enhanced CAT5™

FAXBACK INFORMATION
Request Document Number: 15482
Call 412-746-5500 Anytime



Item			Code	Price
Fast CAT5 Enhanced Bulk Cable, 500-ft. (152-m)				
	4-Pair	PVC	EVNSL40A-0500	$99.95
		Plenum	EVNSL41A-0500	$199.95

Connectors
Adapters
Premise Wiring

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BLACK BOX
New Look Same Great Quality!
BULK CABLE
CAT5™
PVC • 25-Pair

Black Box Corporation®

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Ordering and 24-Hour Technical Support: 412-746-5500. Order Fax: 800-321-0746.
Technical Support Fax: 412-746-0746. E-mail: info@blackbox.com

BLACK BOX® ISO-9001 CERTIFIED QUALITY SYSTEM ABSOLUTELY GUARANTEED FOR LIFE TECH SUPPORT OUR BEST PRODUCT! Belden BICSI℠ CORPORATE MEMBER

AND TRIM YOUR BUDGET!

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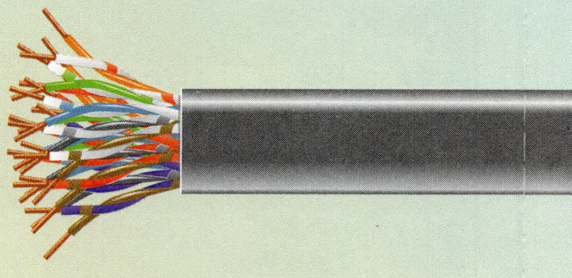
BULK CABLE
CAT5™
PVC • 25-Pair

Including...

Twisted-Pair Cables.

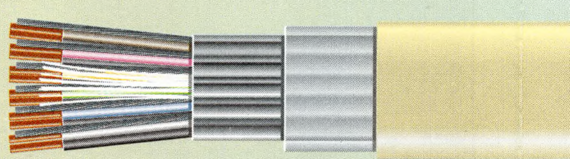
Unshielded Twisted Pair. Category 3, 4, and 5. Enhanced Category 5. Shielded Twisted Pair. You'll find them all at Black Box—your source for bulk cable. And, if you want Belden cable, including super-fast 350-MHz MediaTwist™ 350 cable, we have it. Whether you're installing a new premise cabling system, or simply want to terminate your own cable, call Black Box.



BLACK BOX
BULK CABLE
RS-232
Super Shielded

RS-232 Cables.

Black Box stocks spools and spools of the most commonly used cable ever—RS-232. It's ready to ship today so you can connect your computers, peripherals, printers—and more—tomorrow. Looking for your favorite Belden RS-232 cable? Call Black Box. We have it.



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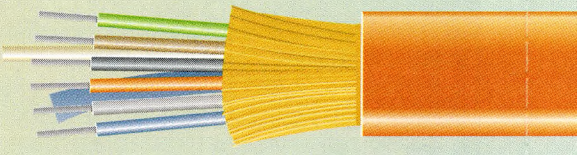
BULK CABLE
FIBEROPTIC
Distribution Style

Fiberoptic Cables.

Installing a new fast, high-bandwidth fiber system? Call Black Box first for all the fiber cable you need to wire your building and to connect buildings. Single-mode. Multimode. Simplex. Duplex. Breakout. Distribution. At Black Box, you'll find the fiber you need for both the short *and* long haul.



BLACK BOX
BULK CABLE
COAXIAL
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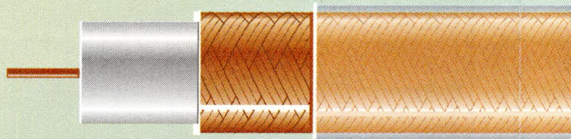
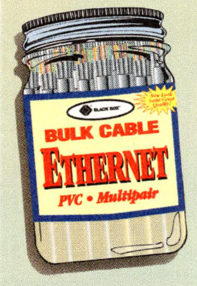
Coaxial Cables.

Connect your Ethernet, ARCNET®, and 3270 networks, your manufacturing facility, even your audio/visual presentation equipment with Black Box cable. Choose from one of the largest selections of coax cable in the world. And if you want quality Belden coax cable, call Black Box. It's here!

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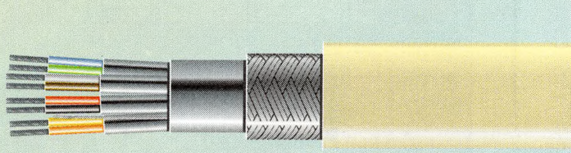
BULK CABLE
ETHERNET
PVC • Multipair

LAN Cables *and More!*

Make all your AS/400®, S/3X, Token Ring, and other network and peripheral connections with Black Box. Whether you need common cable for new technologies *or* hard-to-find cable for vintage technologies, you'll find it at Black Box.



Can't Find the Bulk Cable You Need? Just Ask! That's Why Black Box Is The World's Source for Connectivity.℠

BLACK BOX®

BULK CABLE GUIDE

Black Box Is THE Source

No matter what you want to connect, Black Box has the cable you need. Choose from the largest selection of cables you'll find anywhere—for any application—from the simplest (Category 3) to the most complex (fiber, coax,

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BULK RS-232: INSTRUMENTATION AND COMPUTER CABLES FOR EIA RS-232 AND CAD/

Brand	Code	Description	No. of Pairs	NEC® Rating	Gauge (Stranding)	Shield	Drai Wire
BLACK BOX®	**ECN04A–ECN25A**	Tinned copper, PVC insulated, multi-paired	2, 3½, 6, 8, 12½	CM	24 AWG (7 x 30)	Unshielded	None
Belden	**9501**	Tinned copper, PVC insulated, multi-paired	1	CM	24 AWG (7 x 32)	Metallic foil	24 AW
Belden	**9502–9505**	Tinned copper, PVC insulated, twisted pairs	2–5	CM	24 AWG (7 x 32)	Metallic foil	24 AW
BLACK BOX®	**EDN04A–EDN25A**	Tinned copper, polyethelene insulated, twisted pairs	2, 3½, 6, 8, 12½, 15, 18, 25	CM	24 AWG (7 x 32)	Metallic foil	22 AW
Belden	**8332–8355**	Tinned copper, PVC insulated, multi-paired	2–7, 10, 12½, 15, 18, 25	CM	24 AWG (7 x 32)	Metallic foil, 65% tinned copper braid	None
Belden	**8102–8125**	Tinned copper, Datalene insulated, twisted pairs	2–8, 10, 12½ 15, 18, 25	CM	24 AWG (7 x 32)	Metallic foil, 65% tinned copper braid	24 AW
BLACK BOX®	**EMN04A–EMN25A**	Tinned copper, polyethelene insulated, twisted pairs	2, 3½, 6, 8, 12½	CM	24 AWG (7 x 32)	Metallic foil, tinned copper braid	None
BLACK BOX®	**ERN04A–ERN24A–**	Tinned copper, cellular exolefin polymer insulated, twisted pairs	2, 3, 6, 12	CM	24 AWG (7 x 32)	Individually shielded pairs with metallic foil	24 AW Each P
BLACK BOX®	**ESN05A–ESN24A**	Tinned copper, PVC insulated, twisted pairs	2, 3, 6, 12	CM	22 AWG (7 x 30)	Individually shielded pairs with metallic foil	24 AW Each P
BLACK BOX®	**EYN04A–EYN25A–**	Solid copper, teflon (FEP) insulated, twisted pairs	2, 6, 12½	CMP	24 AWG (7 x 32)	Metallic foil plus tinned copper braid	22 AW

BULK TWISTED-PAIR CABLE: FOR UTP AND STP APPLICATIONS

Brand	Type	Conductor	Pairs	Super-Fast CAT5 350 MHz	Enhanced CAT5 155 MHz	CAT5 100 MHz	Category 4 16 MHz	Category 3 4 MHz
Unshielded Twisted Pair								
BLACK BOX®	**PVC**	Solid	2			**EYN717A**	**EYN715A**	**EYN712A**
			4		**EVNSL40A**	**EYN737A**	**EYN735A**	**EYN730A**
			25			**EVNSL50A**	**EYN760A**	
		Stranded	4			**EVNSL01A**		
	Plenum	Solid	2			**EYN718A**	**EYN716A**	**EYN714A**
			4		**EVNSL41A**	**EYN738A**	**EYN736A**	**EYN734A**
			25			**EVNSL51A**	**EYN761A**	
Belden	**PVC**	Solid	2					**1227A**
			4	**1872A**	**1700A**	**1583A**		**1229A1**
			25					**1232A1**
		Stranded	4		**1752A**			
	Plenum	Solid	2					**1243A2**
			4	**1874A**	**1701A**	**1585A**		**1245A2**
			25					**1247A**
Shielded Twisted Pair								
BLACK BOX®	**PVC**	Stranded	4			**EVMSL06A**		
		Solid	4			**EVNSL70A**		
	Plenum	Solid	4			**EVNSL71A**		

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BLAC BOX®

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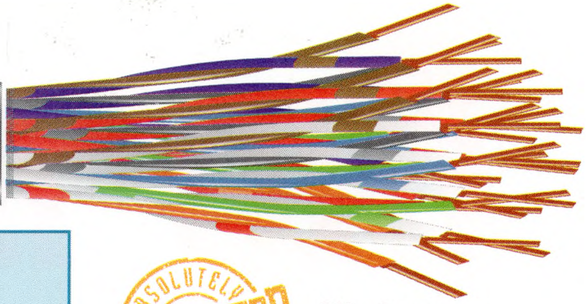


Category 5, RS-232). For more details, see the ***BLACK BOX® Catalog***.
Can't find it? Need a specific brand? Call Black Box—we'll get it for you!
For ordering and 24-hour Technical Support, dial **412-746-5500**.

ABSOLUTELY GUARANTEED FOR LIFE

All of our copper cables are Guaranteed for Life!

D CAD/CAM APPLICATIONS

Drain Wire	Color/ Material	Nom. Imp. (ohms)	Nom. Cap. (pF/ft.)
None	Gray PVC	70	50
24 AWG	Chrome PVC	75	40
24 AWG	Chrome PVC	75	30
22 AWG	Beige PVC	115	12
None	Chrome PVC	75	30
24 AWG	Chrome PVC	100	12.5
None	Beige PVC	115	12
24 AWG Each Pair	Beige PVC	110	13
24 AWG Each Pair	Beige PVC	45	30
22 AWG	Beige Teflon®	100	12

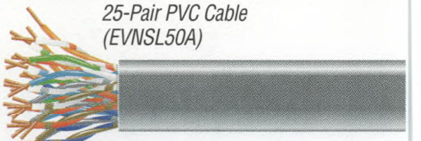
BULK FIBER CABLE: FOR INDOOR AND OUTDOOR RUNS

Description		Fiber Count	Indoor/Riser	Indoor/Plenum
Tight buffered	**Simplex**	1	**EFN4050A**	**EFP4050A**
	Zipcord	2	**EFN4060A**	**EFP4060A**
Single-Mode		6	**EFN006A**	**EFP006A**
		12	**EFN012A**	**EFP012A**
Multimode Duplex		2	**EFN062A**	**EFP062A**
Breakout Style		4	**EFN1004A**	**EFP1004A**
		6	**EFN1006A**	**EFP1006A**
Distribution Style		6	**EFN2006A**	**EFP2006A**
		12	**EFN2012A**	**EFP2012A**
Description		**Fiber Count**	**Indoor/Outdoor**	**Outdoor**
Stranded Loose-Tube		6		**EFN3006A**
		12	**EFP4012A**	**EFN3012A**
		24	**EFP4024A**	**EFN3024A**
		48	**EFP4048A**	
Armored		6		**EFN4070A**
		12		**EFN4075A**
		24		**EFN4080A**

Looking for Twinax, ThinNet, ThickNet, Ribbon Cable and More? Call Tech Support at 412-746-5500.

BULK COAX CABLES: COMPUTER, INSTRUMENTATION AND BROADCAST APPLICATIONS

Brand	Code	Type	Style	Temp. Rating	Gauge (AWG) (Stranding)	Shield	Nom. Imp. (ohms)	Nom. Cap. (pF/ft.)
Belden	**88240**	RG58/u	Plenum	200° C	20 Solid	Tinned copper braid, 95% coverage	53.5	27.5
	82240	RG58/u	Plenum	75° C	20 Solid	Tinned copper braid, 95% coverage	53.5	27.5
	89907	RG58/u	Plenum	150° C	20 (19 x 32)	Duobond II, 94% tinned copper braid, 100% coverage	50	25.4
	88241	RG59/u	Plenum	200° C	23 Solid	Bare copper braid, 97% coverage	75	19.5
	89108	RG59/u	Plenum	200° C	20 Solid	Duofoil, 96% tinned copper braid, 100% coverage	75	16.5
	89292	RG-11	Plenum	200° C	14 Solid	Duofoil, 63% tinned copper braid, 100% shield coverage	75	16.3
	88281	RG-11/u	Plenum	150° C	20 Solid	Tinned copper double braid, 98% shield coverage	75	19.5
	82120	RG-6/u	Plenum	75° C	18 Solid	Duofoil, 95% tinned copper braid, 100% shield coverage	75	16.5
	82248	RG-6/u	Plenum	75° C	18 Solid	Duofoil, 63% tinned copper braid, 100% shield coverage	75	16.5
	86262	RG62/u	Plenum	200° C	22 Solid	Bare copper braid, 96% shield coverage	93	12.8
	89269	RG62/u	Plenum	200° C	22 Solid	Bare copper braid, 94% shield coverage	93	12.8
	82267	RG62	Plenum	75° C	22 Solid	Bare copper braid, 96% shield coverage	93	12.8
BLACK BOX®	**ETN59A**	RG59	PVC	75° C	23 Solid	Bare copper braid, 95% coverage	75	21.5
	ETN62A	RG62	PVC	75° C	22 Solid	Copper braid, 95% coverage	95	13.5
	ETN66A	RG62	Plenum	125° C	22 Solid	Bare copper braid, 95% coverage	93	13.5



25-Pair PVC Cable (EVNSL50A)

CAT5 25-Pair Bulk Cable

JUMBO CAT5™ Cable Delivers Multiple Pairs to Your Data Center—with One Pull!

- Pull one trunk cable and get 25 unshielded twisted pairs (up to six 4-wire sets).
- Extended performance specifications approved to 100 MHz.
- 100% ETL verified. Fully compatible with EIA/TIA 568A requirements.
- 24 AWG solid-conductor cable.

FAXBACK INFORMATION
Request Document Number: 16500
Call 412-746-5500 Anytime

SPECIFICATIONS

Capacitance — 1000-pF/1000-ft. maximum at 1 KHz
Jacket — EVNSL50A: PVC for non-plenum applications only;
EVNSL51A: FEP for plenum applications
Performance Rating — Up to 100 MHz
Resistance — 28.6-Ohms/1000-ft. maximum at 20°C
Standards — Category 5 EIA/TIA 568A;
EVNSL50A: UL® (Type CMR), CSA (Type CMG);
EVNSL51A: UL® (Type MPP)

Item	Code	Price
CAT5 25-Pair Bulk Cable (500-ft. [152-m] Spool)		
PVC	EVNSL50A-0500	**$799.95**
Plenum	EVNSL51A-0500	**$2295.00**

Custom lengths are available. Call for details.

You may also need:

Item	Code	Price
Modular Crimp Tool	FTM40	**$113.00**
Die Set for CAT5 Plugs	FTM50	**$64.00**
High-Performance Modular Plugs (Unshielded) (Pack of 25)	FM730	**$32.95**
Punchdown Block Tool	FT360	**$75.00**
Punchdown Block Tool and Type 110 Blades	FT362	**$99.50**

Category 4 Solid Bulk Cable

For 20-MHz Applications.

SOLID

4-Pair PVC Cable (EYN735A)

FAXBACK INFORMATION
Request Document Number: 11055
Call 412-746-5500 Anytime

SPECIFICATIONS

Capacitance — 15 pF
Conductor Gauge — 24 AWG
Frequency — Up to 20 MHz
Impedance — 100 ± 15 ohms

Item		Code	Price
Category 4 Solid Bulk Cable			
2-Pair			
PVC	500-ft. (152-m)	EYN715A-0500	**$54.00**
	1000-ft. (304-m)	EYN715A-1000	**$107.00**
	Custom Lengths	EYN715A	**$.12/ft.**
Plenum	500-ft. (152-m)	EYN716A-0500	**$93.00**
	1000-ft. (304-m)	EYN716A-1000	**$185.00**
	Custom Lengths	EYN716A	**$.21/ft.**

Item		Code	Price
Category 4 Solid Bulk Cable			
4-Pair			
PVC	500-ft. (152-m)	EYN735A-0500	**$62.00**
	1000-ft. (304-m)	EYN735A-1000	**$124.00**
	Custom Lengths	EYN735A	**$.13/ft.**
Plenum	500-ft. (152-m)	EYN736A-0500	**$155.00**
	1000-ft. (304-m)	EYN736A-1000	**$310.00**
	Custom Lengths	EYN736A	**$.35/ft.**

Item		Code	Price
Category 4 Solid Bulk Cable			
25-Pair			
PVC	500-ft. (152-m)	EYN760A-0500	**$447.50**
	1000-ft. (304-m)	EYN760A-1000	**$887.50**
	Custom Lengths	EYN760A	**$.91/ft.**
Plenum	500-ft. (152-m)	EYN761A-0500	**$1037.50**
	1000-ft. (304-m)	EYN761A-1000	**$2067.50**
	Custom Lengths	EYN761A	**$2.16/ft.**

DataTwist® 3 UTP Cable

2-, 4-, and 25-Pair Category 3 Cable for 16-MHz Applications.

SOLID

25-Pair PVC Cable (1232A1)

SPECIFICATIONS

Cable Construction — PVC or Plenum
Cable Type — Solid UTP
Conductor Gauge — 24 AWG
Frequency — Up to 16 MHz
Impedance — 100 ± 22 ohms
Nominal Capacitance — 2- and 4-Pair: 19 pF/ft.; 25-Pair: 22 pF/ft.
Standards — EIA/TIA 568-A Category 3, UL® listed
Weight — 1227A1: 8.9 lb. (4 kg); 1229A1: 17.4 lb. (7.9 kg); 1232A1: 88.2 lb. (40 kg); 1243A2: 10.2 lb. (4.6 kg); 1245A2: 19.2 lb. (8.7 kg); 1247A: 124 lb. (56.2 kg)

Belden

Item	Code	Price
DataTwist® 3 UTP Cable, 1000-ft. (304.8-m)		
PVC NEC® CMR		
2-Pair	1227A	**$67.95**
4-Pair	1229A1	**$99.95**
25-Pair	1232A1	**$529.95**
Plenum, 1000-ft. (304.8-m) NEC® CMP		
2-Pair	1243A2	**$149.95**
4-Pair	1245A2	**$215.95**
25-Pair	1247A	**$1247.95**

Crimp Tools, **pp. 156–158.**

Category 3 Solid Bulk Cable

2- and 4-Pair Category 3 Cable for Phone, Baluns, and Line Driver 16-MHz Applications.

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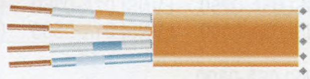

2-Pair PVC Cable (EYN712A)

NOTE: Not recommended for Token Ring or Ethernet.

SPECIFICATIONS

Capacitance — 18 pF
Conductor Gauge — 24 AWG
Frequency — Up to 16 MHz
Impedance — 100 ± 15 ohms

Item			Code	Price
Category 3 Solid Bulk Cable (NEC®, CM, CMR, CMP)				
PVC				
	2-Pair	500-ft. (152-m)	EYN712A-0500	**$29.95**
		1000-ft. (304-m)	EYN712A-1000	**$57.95**
		Custom Lengths	EYN712A	**$.09/ft.**
	4-Pair	500-ft. (152-m)	EYN730A-0500	**$49.95**
		1000-ft. (304-m)	EYN730A-1000	**$99.95**
		Custom Lengths	EYN730A	**$.11/ft.**
Plenum				
	2-Pair	500-ft. (152-m)	EYN714A-0500	**$69.95**
		1000-ft. (304-m)	EYN714A-1000	**$120.95**
		Custom Lengths	EYN714A	**$.15/ft.**
	4-Pair	500-ft. (152-m)	EYN734A-0500	**$89.95**
		1000-ft. (304-m)	EYN734A-1000	**$169.95**
		Custom Lengths	EYN734A	**$.21/ft.**

Bulk Telephone Cable

Put Your Phone Lines Where You Need Them.

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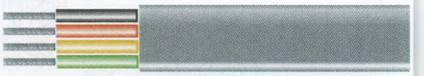


4-Conductor Cable (EL04A)

- Use for telephones, modems, fax machines, DEConnect™.

SPECIFICATIONS

Cable Type — Gray PVC (flat satin)
Resistance — 45 ohms/1000 ft.

Item		Code	Price
Telephone Cable			
4 Conductors			
	500-ft. (152-m)	EL04A-5	**$46.95**
	1000-ft. (304-m)	EL04A-10	**$84.95**
	2000-ft. (609-m)	EL04A-20	**$179.95**
	Custom Lengths	EL04A	**$.11/ft.**
6 Conductors			
	500-ft. (152-m)	EL06A-5	**$59.95**
	1000-ft. (304-m)	EL06A-10	**$109.95**
	2000-ft. (609-m)	EL06A-20	**$199.95**
	Custom Lengths	EL06A	**$.16/ft.**
8 Conductors			
	500-ft. (152-m)	EL08A-5	**$69.95**
	1000-ft. (304-m)	EL08A-10	**$139.95**
	2000-ft. (609-m)	EL08A-20	**$279.95**
	Custom Lengths	EL08A	**$.22/ft.**

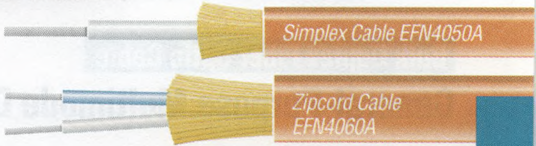
Tight-Buffered Cordage Fiber Optic Cable

FDDI-Grade Bulk Tight-Buffer Cable.

- Fiber is tight-buffered (coated with plastic to a 900-micron diameter) surrounded with Kevlar® for tensile strength and encased in a flexible plenum- or riser-rated jacket.
- Easy to handle, strip, and attach connectors.
- Use as a horizontal cable for work areas, patch panels, and connecting devices to the network.
- Choose from Simplex, a single-fiber cable, or Zipcord, two fiber cables joined together with a quick zip-apart seam.

SPECIFICATIONS

Cladding Diameter — 125 µm ± 2.0
Core Diameter — 62.5 µm ± 3.0
Fiber Type — Multimode
Maximum Attenuation — 3.5/1.0 dB/km
Maximum Tensile Load — Simplex: Short-Term: 60 lb. (260 Newtons), Long-Term: 20 lb. (90 Newtons); Zipcord: Short-Term: 90 lb. (400 Newtons), Long-Term: 30 lb. (133 Newtons)
Minimum Bandwidth — 160/500 MHz-km
Minimum Bend Radius — Loaded: 2.0"; Unloaded: 1.0"
Outer Diameter — Simplex: 0.10"; Zipcord: 0.10" x 0.21"
Tight-Buffered Diameter — 900 µm ± 30
Weight — Simplex: 5.8 lb./kft. (8.6 kg/km); Zipcord Riser: 11.7 lb./kft. (17.4 kg/km); Zipcord Plenum: 11.9 lb./kft. (17.7 kg/km)

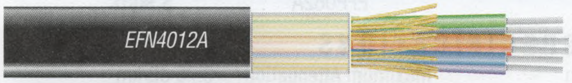


FAXBACK INFORMATION
Request Document Number: 18746
Call 412-746-5500 Anytime

Item		Code	Price
Tight-Buffered Cordage Fiber Optic Cable, UL® Listed, 1000-ft. (304.8-m)			
Simplex	Riser	EFN4050A-1000	**$329.95**
	Plenum	EFP4050A-1000	**$359.95**
Zipcord	Riser	EFN4060A-1000	**$599.95**
	Plenum	EFP4060A-1000	**$649.95**

Stranded Loose-Tube Indoor/Outdoor Fiber Cable

Bulk Fiber for Inter/Intra-Building Runs.



- Get the maximum use out of one economical cable: multiple fibers (up to 72) and indoor/outdoor use.
- Use just one fiber cable for runs between wiring closets *and* between buildings.
- Designed with 12, 24, or 48 250-micron fibers in buffer tubes stranded around a central member.
- Cable includes a rip cord, core binder, flame-retardant layer, overcoat, aramid yarn coating, and an outer jacket.

FAXBACK INFORMATION
Request Document Number: 18753
Call 412-746-5500 Anytime

Item	Code	Price
Stranded Loose-Tube Indoor/Outdoor Fiber Cable 1000-ft. (304.8-m)		
12-Strand	EFN4012A-1000	**$2689.95**
24-Strand	EFN4024A-1000	**$4269.95**
48-Strand	EFN4048A-1000	**$7449.95**

Higher strand count available—call Tech Support.

SPECIFICATIONS

Buffer Tubes — 6
Crush Resistance — 1000 lb. (453.6 kg)
Fiber Count — 12, 24, or 48
Fiber Type — Multimode, 62.5/125µm
Flexing — 25 @ 11.2"
Impact Resistance — 25 @ 4.3 lb/ft.
Maximum Attenuation — 3.5/1.0 dB/km
Maximum Vertical Rise — 740 ft. (225 m)
Maximum Tensile Load — Short-Term: 600 lb. (2700 Newtons); Long-Term: 135 lb. (600 Newtons)
Minimum Bandwidth — 160/500 MHz-km
Minimum Bend Radius — Loaded: 11.4"; Unloaded: 5.7"
Outer Diameter — 0.57"
Weight — 135 lb./kft. (194 kg/km)

Armored Outside Plant Fiber Cable

Outdoor Fiber Cable that's Tough as Steel!

- These Cables deliver optimum performance in extreme environmental conditions.
- Steel armor and steel-strength members provide excellent mechanical protection.
- Install aerially, in ducts, or bury it.
- Cable consists of color-coded fibers in loose-buffer tubes stranded around a central member. Core is surrounded by an aramid yarn tensile-strength layer and jacketed with medium-density polyethylene.

FAXBACK INFORMATION
Request Document Number: 18760
Call 412-746-5500 Anytime

Item	Code	Price
Armored Outside Plant Fiber Cable 1000-ft. (304.8-m)		
6-Strand	EFN4070A-1000	**$1659.95**
12-Strand	EFN4075A-1000	**$2559.95**
24-Strand	EFN4080A-1000	**$4429.95**

Higher strand count available—call Tech Support.

SPECIFICATIONS

Crush Resistance — 1000 lb. (453.6 kg)
Fiber Count — 6, 12, or 24
Fiber Type — Multimode, 62.5/125µm
Impact Resistance — 25 @ 4.3 lb./ft.
Installation Loading — 600 lb. (2700 Newtons)
Maximum Attenuation — 3.5/1.0 dB/km
Minimum Bandwidth — 160/500 MHz-km
Minimum Bend Radius — Loaded: 11.2"; Unloaded: 5.6"
Outer Diameter — 0.56"
Weight — 1500 lb. (680.4 kg)

Single-Mode Bulk Fiber Optic Cable

Save! Buy Your Single-Mode Fiber Cable in 500-Ft. Reels.

- For indoor/outdoor use. Run through riser shafts, in wiring closets, air plenums, and in outdoor conduits below the frost line.
- Provides increased transmission distance and no interference from mulitple light wavelengths.
- Use fewer repeaters.
- Fan cables out to send fibers to different locations.
- 8.5-µm fiber core.
- 100% tested.

Item	Code	Price
Single-Mode Bulk Fiber Optic Cable, 500-ft. (152-m) Reels		
PVC (OFNR)		
6-Fiber	EFN006A-0500	**$1359.95**
12-Fiber	EFN012A-0500	**$1999.95**
Plenum (OFNP)		
6-Fiber	EFP006A-0500	**$2499.95**
12-Fiber	EFP012A-0500	**$3999.95**

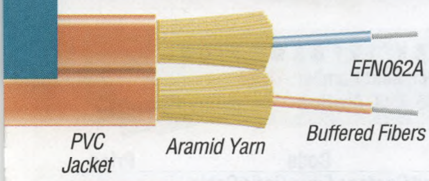
FAXBACK INFORMATION
Request Document Number: 17147
Call 412-746-5500 Anytime

Connectors
Adapters
Premise Wiring

Black Box Bulk Gives You All the Advantages of Fiber—in Any Length You Need.

Bulk Duplex Fiber Optic Cable

General-Purpose Multimode Duplex Cable.



- General-purpose multimode 62.5/125-micron in duplex version.
- 50/125-micron and 100/140-micron versions also available.

SPECIFICATIONS

Buffer Diameter — 900 µm
Cladding Diameter — 125 µm
Crush Resistance — 750 N/cm
Fiber Type — Multimode (graded index)
Maximum Attenuation — 5 dB/km
Minimum Bandwidth (3 dB) — 160 MHz-km
Minimum Bend Radius — 5 cm
Operating Temperature — -20° to + 70°C (-4° to +158°F)
Outside Diameter — 0.12" x 0.24" (3 x 6.1 mm)
Weight (nominal kg/km) — 27

Item	Code	Price
Bulk Duplex Fiber Optic Cable		
PVC—Riser Applications (OFNR/FT4) 62.5/125-micron		
500-ft. (152.4-m)	EFN062A-0500	**$332.50**
1000-ft. (304.8-m)	EFN062A-1000	**$665.00**
Custom Lengths	EFN062A	**$.70/ft.**
Plenum Applications (OFNP/FT6) 62.5/125-micron		
500-ft. (152.4-m)	EFP062A-0500	**$427.00**
1000-ft. (304.8-m)	EFP062A-1000	**$855.00**
2000-ft. (609.6-m)	EFP062A-2000	**$1710.00**
Custom Lengths	EFP062A	**$.90/ft.**

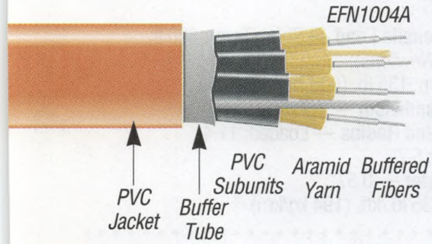
Black Box Explains...

Breakout-Style Cables.

With Breakout- or Fanout-style cables, the fibers are packaged individually or in groups. This enables you to divide cables to serve users with individual fiber lines and eliminates the need for patch panels.

Bulk Fiber Optic Cable (Breakout Style)

Designed for Voice, Data, Video, and Imaging Transmissions.



- Breakout design enables individual routing of fibers for termination and maintenance.
- Tight-buffered, simplex cords are stranded around a central member and encased in a flexible jacket.
- Rugged design provides maximum protection and easy connections.
- Multimode 62.5/125-micron fiber.

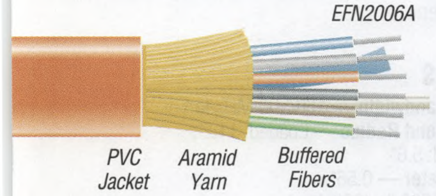
SPECIFICATIONS

Buffer Diameter — 900 µm
Fiber Type — 62.5-µm core, 125-µm cladding
Maximum Attenuation — 3.75 dB/km @ 850 nm, 1.5 dB/km @ 1300 nm
Minimum Bandwidth — 160 Hz-km @ 850 nm, 500 Hz-km @1300 nm

Item		Code	Price
Bulk Fiber Optic Cable (Breakout Style)			
PVC—Riser Applications (OFNR/FT4)			
500-ft. (152.4-m)	4-Fiber	EFN1004A-0500	**$713.00**
Custom Lengths	4-Fiber	EFN1004A	**$1.50/ft.**
500-ft. (152.4-m)	6-Fiber	EFN1006A-0500	**$950.00**
Custom Lengths	6-Fiber	EFN1006A	**$2.00/ft.**
Plenum Applications (OFNP/FT6)			
500-ft. (152.4-m)	4-Fiber	EFP1004A-0500	**$950.00**
Custom Lengths	4-Fiber	EFP1004A	**$2.00/ft.**
500-ft. (152.4-m)	6-Fiber	EFP1006A-0500	**$1900.00**
Custom Lengths	6-Fiber	EFP1006A	**$4.00/ft.**

Bulk Fiber Optic Cable (Distribution Style)

Designed for Backbone Inter/Intrabuilding Applications.



- Designed for backbone inter/intrabuilding applications, this small, light cable delivers a higher fiber count.
- Color-coded, tight-buffered fibers are stranded around a central member, surrounded with Kevlar®, and encased in a plenum (OFNP) or riser (OFNR) rated jacket.
- 62.5/125-micron fiber.

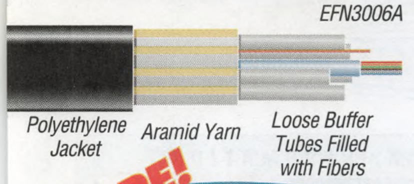
SPECIFICATIONS

Bandwidth — 4.5/3.5 dB/km
Fiber Type — 62.5-µm core, 125-µm cladding
Maximum Attenuation — 3.75 dB/km @ 850 nm, 1.5 dB/km @ 1300 nm
Minimum Bandwidth — 160 Hz-km @ 850 nm, 500 Hz-km @1300 nm

Item		Code	Price
Bulk Fiber Optic Cable (Distribution Style)			
PVC—Riser Applications (OFNR)			
500-ft. (152.4-m)	6-Fiber	EFN2006A-0500	**$832.00**
Custom Lengths	6-Fiber	EFN2006A	**$1.75/ft.**
500-ft. (152.4-m)	12-Fiber	EFN2012A-0500	**$1425.00**
Custom Lengths	12-Fiber	EFN2012A	**$3.00/ft.**
Plenum Applications (OFNP)			
500-ft. (152.4-m)	6-Fiber	EFP2006A-0500	**$1093.00**
Custom Lengths	6-Fiber	EFP2006A	**$2.30/ft.**
500-ft. (152.4-m)	12-Fiber	EFP2012A-0500	**$2138.00**
Custom Lengths	12-Fiber	EFP2012A	**$4.50/ft.**

Stranded Loose-Tube Outside-Plant Fiber Cable

This Fiber Cable Braves the Elements.



- Designed for outdoor applications.
- Ideal for going from building to building.
- Delivers optimum performance in extreme conditions—aerial installations, ducts, or buried.
- Multimode 62.5/125-micron fiber.
- FDDI compliant.

MORE! Fiber Optic Cable, see pp. 74–76, 117–118.

SPECIFICATIONS

Bandwidth — 4.5/3.5 dB/km
Fiber Type — 62.5-/125-/250-micron loose tube multimode fibers

Item	Code	Price
Stranded Loose-Tube Outside-Plant Fiber Cable		
6-Fiber	EFN3006A	**$2.00/ft.**
12-Fiber	EFN3012A	**$3.50/ft.**
18-Fiber	EFN3018A	**$5.00/ft.**
24-Fiber	EFN3024A	**$7.00/ft.**
30-Fiber	EFN3030A	**$8.50/ft.**

NOTE: Minimum order is 1000 feet (304.8 m). Cable is shipped in large protective reels. Cable and spools can weigh over 100 pounds (45 kg).

BLACK BOX® + Belden = the best! ABSOLUTELY GUARANTEED FOR LIFE

FAXBACK INFORMATION
For All Belden Cables on This Page: 18715
Call 412-746-5500 Anytime

IBM LAN Cables

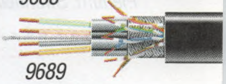
All Lengths Shown—500-ft. (152.4-m); other lengths available

Construction: Bare copper, flame-retardant foam polyethylene or foam FEP-insulated conductors in 2 pairs; each pair individually Beldfoil® shielded with overall tinned copper braid shield; overall black jacket with ripcord. IBM® qualified Type 1A media cable for use in IBM cabling systems. Meets IEEE 802.5 and EIA/TIA 568-A specifications. Applications include Token Ring (4/16 Mbps) and FDDI over copper, and video.

IBM LAN Cable	Pairs	AWG (Stranding)	Jacket	Nom. Imp. (ohms)	Nom. Cap. pF/ft.	Code	Price
IBM Type 1A, PVC	2	22 Solid	Black PVC	150	8.5	9688	**$159.95**
IBM Type 2A, PVC	6 (2 data, 4 voice)	22 Solid	Black PVC	Data: 150 @1MHz Voice: 600 @1kHz	8.5	9689	**$239.95**
IBM Type 1A, Plenum	2	22 Solid	Black PVDF	150	8.5	89688	**$599.95**

Belden

9688


9689

ThinNet Cables

All Lengths Shown—500-ft. (152.4-m); other lengths available

9907: Tinned copper, foam poylethylene dielectric, Duobond II shield, 93% tinned copper braid overall.

82907, 89907: Plenum versions of 9907. Tinned copper, foam FEP Teflon® dielectric, Duobond II shield, 93% tinned copper braid overall.

Thin Ethernet Trunk Cable	Weight	AWG (Stranding)	Jacket	Nom. Imp. (ohms)	Nom. Cap. pF/ft.	Code	Price
PVC	11.8 lb.	20 (19 x 32)	Gray PVC	50	25.4	9907	**$129.95**
Plenum	14.9 lb.	20 (19 x 32)	Natural Flamarrest®	50	25.4	82907	**$259.95**
	15.2 lb.	20 (19 x 32)	Gray Fluorocopolymer	50	25.4	89907	**$204.95**

Belden

9907

Thicknet Trunk Cables

All Lengths Shown—500-ft. (152.4-m); other lengths available

9880: Solid bare copper center conductor; foam PE dielectric; Duobond II, 94% tinned copper braid, Duofoil shield, 90% tinned copper braid; yellow PVC jacket; ring band stripes marked every 2.5 meters to aid in tap placement.

89880: Plenum version. Orange fluorocopolymer jacket, foam FEP dielectric.

Thicknet Trunk Cable	Weight	AWG (Stranding)	Jacket	Nom. Imp. (ohms)	Nom. Cap. pF/ft.	Code	Price
Non-Plenum	63.6 lb.	0.0855	Yellow PVC	78	26	9880	**$399.95**
Plenum	74.9 lb.	0.0855	Orange Fluorocopolymer	50	26	89880	**$1049.95**

Belden

9880

Thicknet Transceiver Cables

All Lengths Shown—500-ft. (152.4-m); other lengths available

Construction: Tinned copper, Datalene® insulated, twisted pairs, each pair individually Beldfoil shielded, overall polyester isolation tape and Duofoil/tinned copper braid shield (95% coverage), 22 AWG stranded tinned copper drain wire.

Twinax Cable	Pairs	Weight	Conductors	Jacket	Nom. Imp. (ohms)	Nom. Cap. pF/ft.	Code	Price
Non-Plenum	4	55.3 lb.	20 (7 x 28)	Light Gray PVC	78	16.7	9901	**$495.95**

Belden

9901

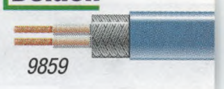
Twinax Computer Cables

9859: Tinned copper, (1) conductor bare strand for ID, polyethylene insulated, tinned copper braid, 85% shield. 1000 ft. (304.8 m).

82907: (1) conductor tinned copper, (1) conductor bare, FEP Teflon insulated, Duofoil/85% tinned copper braid 100% shield coverage. 500 ft. (152.4m).

Twinax Cable	Weight	AWG (Stranding)	Jacket	Nom. Imp. (ohms)	Nom. Cap. pF/ft.	Code	Price
Non-Plenum 1000 ft.	35.5 lb.	20 (7 x 28)	Black Non-contaminating PVC	78	19.7	9859-1000	**$578.95**
Plenum 500 ft.	28.2 lb.	2 cond. (7 x 28)	Black-Tint Teflon	78	18.4	89207	**$639.95**

Belden


9859

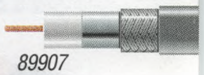
Coax Computer, Instrumentation, and Broadcast Cables

All Lengths Shown—500-ft. (152.4-m), except where indicated; other lengths available

Coax Cable	Weight	AWG (Stranding)	Shielding/Shield Coverage	Nom. Imp. (ohms)	Nom. Cap. pF/ft.	Code	Price
RG58/U Plenum	4.7 lb.	20 Solid	Tinned Copper Braid/95%	53.5	27.5	88240	**$405.95**
	13.1 lb.	20 Solid	Tinned Copper Braid/95%	53.5	27.5	82240	**$299.95**
ThinNet Plenum	15.2 lb.	20 (19 x 32)	Duobond 11 + 94% Tinned Copper Braid/100%	50	25.4	89907	**$204.95**
RG59/U Plenum	22.0 lb.	23 Solid	Bare Copper Braid / 97%	75	19.5	88241	**$499.95**
	20.4 lb.	20 Solid	Duofoil + 96% Tinned Copper Braid/100%	75	16.5	89108	**$499.95**
RG11/U Plenum	42.0 lb.	14 Solid	Duofoil + 63% Tinned Copper Braid /100%	75	16.3	89292	**$1059.95**
	48.2 lb.	20 Solid	Tinned Copper Double Braid/98%	75	19.5	88281	**$1295.95**
RG62/U Plenum	24.0 lb.	22 Solid	Bare Copper Braid/94%	75	19.5	89269	**$339.95**
	20.2 lb.	22 Solid	Bare Copper Braid/96%	93	12.8	86262	**$364.95**
Available in 1000-ft. lengths ONLY							
RG6/U Plenum	22.7 lb.	18 Solid	Duofoil + 95% Tinned Copper Braid/100%	75	16.5	82120-1000	**$1024.95**
	19.0 lb.	18 Solid	Duofoil + 63% Tinned Copper Braid/100%	75	16.5	82248-1000	**$799.95**
RG62/U Plenum	19.0 lb.	22 Solid	Bare Copper Braid/96%	93	12.8	82269-1000	**$431.95**

Belden

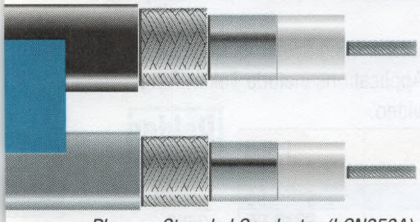
88240


89907

Bulk ThinNet Cable

ThinNet Cabling for Your 10BASE2 LANs.

Black PVC, Stranded Conductor (LCN300A)



Plenum, Stranded Conductor (LCN350A)

STRANDED

PLUS! Terminated ThinNet Cable, **see p. 77.**

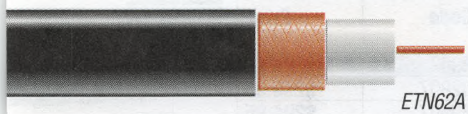
Item	Code	Price
Bulk ThinNet Cable Black PVC, Stranded Conductor		
500-ft. (152.4-m)	LCN300A-0500	$146.00
1000-ft. (304.8-m)	LCN300A-1000	$291.00
2000-ft. (609.6-m)	LCN300A-2000	$582.00
Custom Lengths	LCN300A	$.33/ft.

Item	Code	Price
Bulk ThinNet Cable Gray, Plenum, Stranded Conductor		
500-ft. (152.4-m)	LCN350A-0500	$286.00
1000-ft. (304.8-m)	LCN350A-1000	$571.00
2000-ft. (609.6-m)	LCN350A-2000	$1147.00
Custom Lengths	LCN350A	$.58/ft.

* * *

Bulk Coax Cables—Just Choose the Length You Need.

Bulk Coaxial PVC Cable (RG62)



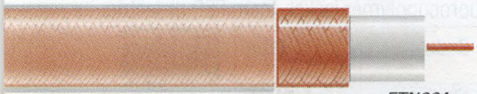
ETN62A

SPECIFICATIONS

Capacitance — 13.5 pF/ft.
Conductor Gauge — 22 AWG, 95% clad steel wire
Conductors — 1
Impedance — 95 ± 3 ohms
Outside Diameter — 0.242"
Shield — 34 AWG copper braid

Item	Code	Price
Bulk Coaxial PVC Cable (RG62), NEC® CL2		
500-ft. (152.4-m)	ETN62A-0500	$97.00
1000-ft. (304.8-m)	ETN62A-1000	$194.00
2000-ft. (609.6-m)	ETN62A-2000	$388.00
Custom Lengths	ETN62A	$.22/ft.

Bulk Coaxial Plenum Cable (RG62)



ETN66A

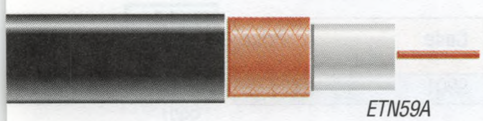
SPECIFICATIONS

Cable Type — Copolymer (clear)
Conductor Gauge — 22 AWG
Conductors — 1
Impedance — 93 ± 5 ohms
Mutual Capacitance — 13.5 pF/ft. ±2 pF
Outside Diameter — 0.242"
Shield — 34 AWG, 95% copper braid
Typical Application — IBM® 3270

Item	Code	Price
Bulk Coaxial Plenum Cable (RG62), NEC® CL2P		
500-ft. (152.4-m)	ETN66A-0500	$264.00
1000-ft. (304.8-m)	ETN66A-1000	$517.00
2000-ft. (609.6-m)	ETN66A-2000	$1023.00
Custom Lengths	ETN66A	$.57/ft.

PLUS! Terminated Coax Cable, **see p. 78.**

Bulk Coaxial PVC Cable (RG59)



ETN59A

SPECIFICATIONS

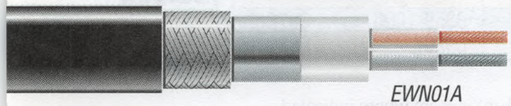
Capacitance — 21.5 pF/ft.
Conductor Gauge — 23 AWG, 95% clad steel wire
Conductors — 1
Impedance — 75 ± 3 ohms
Outside Diameter — 0.242"
Shield — 100 ohms

Item	Code	Price
Bulk Coaxial PVC Cable (RG59), NEC® CL2		
500-ft. (152.4-m)	ETN59A-0500	$97.00
1000-ft. (304.8-m)	ETN59A-1000	$194.00
2000-ft. (609.6-m)	ETN59A-2000	$388.00
Custom Lengths	ETN59A	$.22/ft.

* * *

Twinax Cable for All Your IBM System 3X or AS/400 Connections.

Bulk Twinaxial PVC Cable



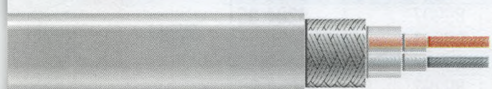
EWN01A

SPECIFICATIONS

Cable Type — Black PVC jacket
Conductor Gauge — 20 AWG, stranded copper
Conductors — 2
Impedance — 100 ohms
Mutual Capacitance — 15.5 pF/ft.
Outside Diameter — 0.330"
Shield — 34 AWG, 95% braided tinned copper
Typical Application — IBM® System 3X, AS/400

Item	Code	Price
Bulk Twinaxial PVC Cable, NEC® CL2		
500-ft. (152.4-m)	EWN01A-0500	$221.00
1000-ft. (304.8-m)	EWN01A-1000	$442.00
2000-ft. (609.6-m)	EWN01A-2000	$883.00
Custom Lengths	EWN01A	$.49/ft.

Bulk Twinaxial Plenum Cable



EWN020A

SPECIFICATIONS

Cable Type — Black PVC jacket
Conductor Gauge — 20 AWG, stranded copper
Conductors — 2
Impedance — 100 ohms
Mutual Capacitance — 15.5 pF/ft.
Outside Diameter — 0.330"
Shield — 34 AWG, 95% braided tinned copper
Typical Application — IBM® System 3X, AS/400

Item	Code	Price
Bulk Twinaxial Plenum Cable, NEC® CL2P		
500-ft. (152.4-m)	EWN020A-0500	$775.00
1000-ft. (304.8-m)	EWN020A-1000	$1550.00
2000-ft. (609.6-m)	EWN020A-2000	$3100.00
Custom Lengths	EWN020A	$1.73/ft.

For Crimp Tools, **see pp. 156–158.**

PLUS! Terminated Twinax Cable, **see p. 79.**

BLACK BOX® + Belden = the best!

FAXBACK INFORMATION
For All Belden Cables on This Page: 18777
Call 412-746-5500 Anytime

RS-232 Cable, Overall Shield, Twisted Multipair

The Right RS-232 Cable for Your Office PC/Instrumentation Connections.

- 24 AWG stranded conductors (7 x 32).
- 100% Beldfoil shield.
- S-R (semi-rigid) PVC insulated.
- 500-ft. lengths.

Construction: Tinned copper, S-R PVC insulated, twisted pairs. Overall Beldfoil® aluminum-polyester shield, 24 AWG stranded tinned copper drain wire.

SPECIFICATIONS

Conductors — 24 (7 x 32)
Jacket — Chrome PVC
Length — 500 ft. (152.4-m); other lengths available
Nom. Capacitance* — 9501: 40 pF/ft.; 9502–9505: 30 pF/ft.
Nom. Impedance — 75 ohms

*Capacitance between conductors.

Belden

ABSOLUTELY GUARANTEED FOR LIFE

9505

Item	Code	Price
RS-232 Cable, Overall Shield, Twisted Multipair		
1 Pair	9501	**$50.95**
2 Pairs	9502	**$77.95**
3 Pairs	9503	**$99.95**
4 Pairs	9504	**$124.95**
5 Pairs	9505	**$137.95**

RS-232 Cable, Overall Foil/Braid Shield, Multipair

Use This Double-Shielded Cable for Your Office PC and CAD/CAM Connections.

- 24 AWG stranded conductors (7 x 32).
- 100% Beldfoil and 65% braid shield.
- S-R (semi-rigid) PVC insulated.
- 500-ft. lengths.

Construction: Tinned copper, S-R PVC insulated, multipaired cable with overall Beldfoil aluminum-polyester shield plus 65% tinned copper braid shield.

SPECIFICATIONS

Conductors — 24 (7 x 32)
Jacket — Chrome PVC
Length — 500 ft. (152.4-m); other lengths available
Nom. Capacitance* — 30 pF/ft.
Nom. Impedance — 75 ohms

*Capacitance between conductors.

Belden

ABSOLUTELY GUARANTEED FOR LIFE

8342

Item	Code	Price
RS-232 Cable, Overall Foil/Braid Shield, Multipair		
2 Pairs	8332	**$129.95**
3 Pairs	8333	**$179.95**
4 Pairs	8334	**$199.95**
5 Pairs	8335	**$229.95**
6 Pairs	8336	**$249.95**
7 Pairs	8337	**$299.95**
10 Pairs	8340	**$389.95**
12½ Pairs	8342	**$469.95**
15 Pairs	8345	**$969.95**
18 Pairs	8348	**$1319.95**
25 Pairs	8355	**$1629.95**

RS-232 Cable, Low-Capacitance, Overall Foil/Braid Shield, Multipair

Use This Double-Shielded, Low-Capacitance, Low-Noise Cable for Long-Distance RS-232 and RS-422 Connections.

- 24 AWG stranded conductors (7 x 32).
- Datalene® insulated with 100% Beldfoil and 65% braid shield.
- Low capacitance.
- Good crush resistance and lightweight.

Construction: Tinned copper, Datalene insulated, twisted pairs. Overall Beldfoil aluminum-polyester shield. 24 AWG stranded tinned copper drain wire. Overall tinned copper braid shield (65% coverage).

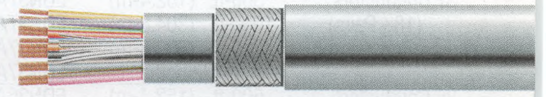
SPECIFICATIONS

Conductors — 24 (7 x 32)
Jacket — Chrome PVC
Length — 500 ft. (152.4-m); other lengths available
Nom. Capacitance* — 12.5 pF/ft.
Nom. Impedance — 100 ohms

*Capacitance between conductors.

Belden

ABSOLUTELY GUARANTEED FOR LIFE


8112

Item	Code	Price
RS-232 Cable, Low-Capacitance, Overall Foil/Braid Shield, Multipair		
2 Pairs	8102	**$179.95**
3 Pairs	8103	**$219.95**
4 Pairs	8104	**$259.95**
5 Pairs	8105	**$329.95**
6 Pairs	8106	**$429.95**
7 Pairs	8107	**$479.95**
8 Pairs	8108	**$499.95**
10 Pairs	8110	**$559.95**
12½ Pairs	8112	**$669.95**
15 Pairs	8115	**$769.95**
18 Pairs	8118	**$1069.95**
25 Pairs	8125	**$1559.95**

Bulk RS-232 Cable for Long Runs in Office and Industrial Environments.

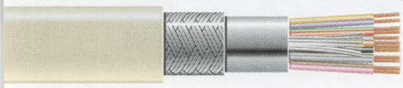
Bulk RS-232 Extended-Distance Data, Quiet, and Plenum Cable

EDN12A

Office (Shielded)

Bulk Extended-Distance Data Cable

- Distances up to 500 ft. (152.4 m).
- For use with RS-232, V.35, RS-422, and RS-485 interfaces.
- Low capacitance, foil-shielded.
- An ideal choice for office environments.



EMN12A

Industrial, Extra Shielding

Bulk Extended-Distance Quiet Cable

- Distances up to 500 ft. (152.4 m).
- Low-capacitance, foil-shielded, with a braided shield.
- Ideal for noisy environments, where cabling runs next to power lines.

ERN12A

Extra Long, Super Shielded

Individually Shielded Low-Capacitance Cable

- Distances up to 4000 ft. (1219.2 m).
- Individual foil shielding around each pair means low capacitance—and long distance.
- Ideal for industrial environments.

EYN12A

Plenum (Shielded)

Bulk RS-232 Plenum Cable

- RS-232 transmission up to 500 ft. (152.4 m).
- Also for RS-422, RS-485, and V.35 interfaces.
- Low-capacitance, foil-shielded.

Item		**Code**	**Price**
Extended-Distance Data Cable—Office Environment, PVC Jacket			
50 Conductors (25 Pairs)	500-ft. (152.4-m)	EDN50A-0500	**$606.00**
	1000-ft. (304.8-m)	EDN50A-1000	**$1211.00**
	2000-ft. (609.6-m)	EDN50A-2000	**$2422.00**
	Custom Lengths	EDN50A	**$1.35/ft.**
37 Conductors (18½ Pairs)	500-ft. (152.4-m)	EDN37A-0500	**$509.00**
	1000-ft. (304.8-m)	EDN37A-1000	**$1018.00**
	2000-ft. (609.6-m)	EDN37A-2000	**$2035.00**
	Custom Lengths	EDN37A	**$1.13/ft.**
25 Conductors (12½ Pairs)	500-ft. (152.4-m)	EDN25A-0500	**$377.00**
	1000-ft. (304.8-m)	EDN25A-1000	**$754.00**
	2000-ft. (609.6-m)	EDN25A-2000	**$1507.00**
	Custom Lengths	EDN25A	**$.76/ft.**
16 Conductors (8 Pairs)	500-ft. (152.4-m)	EDN16A-0500	**$243.95**
	1000-ft. (304.8-m)	EDN16A-1000	**$486.95**
	2000-ft. (609.6-m)	EDN16A-2000	**$972.95**
	Custom Lengths	EDN16A	**$.54/ft.**
12 Conductors (6 Pairs)	500-ft. (152.4-m)	EDN12A-0500	**$216.00**
	1000-ft. (304.8-m)	EDN12A-1000	**$431.00**
	2000-ft. (609.6-m)	EDN12A-2000	**$861.00**
	Custom Lengths	EDN12A	**$.44/ft.**
7 Conductors (3½ Pairs)	500-ft. (152.4-m)	EDN07A-0500	**$144.95**
	1000-ft. (304.8-m)	EDN07A-1000	**$288.95**
	2000-ft. (609.6-m)	EDN07A-2000	**$576.95**
	Custom Lengths	EDN07A	**$.32/ft.**
4 Conductors (2 Pairs)	500-ft. (152.4-m)	EDN04A-0500	**$108.00**
	1000-ft. (304.8-m)	EDN04A-1000	**$216.00**
	2000-ft. (609.6-m)	EDN04A-2000	**$431.00**
	Custom Lengths	EDN04A	**$.22/ft.**

SPECIFICATIONS

Cable Type — Extended-Distance Data, Extended-Distance Quiet, Individually Shielded: Twisted pair, PVC jacket;
Plenum: Twisted pair, Kynar® jacket; Individually Shielded

Capacitance — 12 pF/ft. ± 2 pF/ft.

Conductor Gauge — 24 AWG (7 x 32 AWG) stranded

Resistance — Extended-Distance Data, Extended-Distance Quiet: 25 ohms/1000 ft.;
Plenum: 26.2 ohms/1000 ft. (max.);
Individually Shielded: 16 ohms/1000 ft. (max.)

Shield — Extended-Distance Data: One foil and one copper braid;
Extended-Distance Quiet: Shorted foil with drain wire;
Plenum: Aluminum tape;
Individually Shielded: Foil around each pair, each with a drain wire

Item		**Code**	**Price**
Extended-Distance Quiet Cable—Industrial Environment, PVC Jacket			
25 Conductors (12½ Pairs)	500-ft. (152.4-m)	EMN25A-0500	**$436.95**
	1000-ft. (304.8-m)	EMN25A-1000	**$873.95**
	2000-ft. (609.6-m)	EMN25A-2000	**$1746.95**
	Custom Lengths	EMN25A	**$.97/ft.**
16 Conductors (8 Pairs)	500-ft. (152.4-m)	EMN16A-0500	**$315.95**
	1000-ft. (304.8-m)	EMN16A-1000	**$630.95**
	2000-ft. (609.6-m)	EMN16A-2000	**$1260.95**
	Custom Lengths	EMN16A	**$.70/ft.**
12 Conductors (6 Pairs)	500-ft. (152.4-m)	EMN12A-0500	**$265.95**
	1000-ft. (304.8-m)	EMN12A-1000	**$531.95**
	2000-ft. (609.6-m)	EMN12A-2000	**$1062.95**
	Custom Lengths	EMN12A	**$.59/ft.**
7 Conductors (3½ Pairs)	500-ft. (152.4-m)	EMN07A-0500	**$175.95**
	1000-ft. (304.8-m)	EMN07A-1000	**$351.95**
	2000-ft. (609.6-m)	EMN07A-2000	**$702.95**
	Custom Lengths	EMN07A	**$.39/ft.**
4 Conductors (2 Pairs)	500-ft. (152.4-m)	EMN04A-0500	**$144.95**
	1000-ft. (304.8-m)	EMN04A-1000	**$288.95**
	2000-ft. (609.6-m)	EMN04A-2000	**$576.95**
	Custom Lengths	EMN04A	**$.32/ft.**

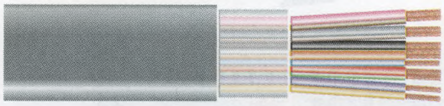
Item		**Code**	**Price**
Individually Shielded Low-Capacitance Cable—Extra Distance, PVC Jacket			
24 Conductors (12 Pairs)	500-ft. (152.4-m)	ERN24A-0500	**$731.00**
	1000-ft. (304.8-m)	ERN24A-1000	**$1388.00**
	2000-ft. (609.6-m)	ERN24A-2000	**$2630.00**
	Custom Lengths	ERN24A	**$1.47/ft.**
12 Conductors (6 Pairs)	500-ft. (152.4-m)	ERN12A-0500	**$385.00**
	1000-ft. (304.8-m)	ERN12A-1000	**$731.00**
	2000-ft. (609.6-m)	ERN12A-2000	**$1386.00**
	Custom Lengths	ERN12A	**$.78/ft.**
6 Conductors (3 Pairs)	500-ft. (152.4-m)	ERN06A-0500	**$210.00**
	1000-ft. (304.8-m)	ERN06A-1000	**$399.00**
	2000-ft. (609.6-m)	ERN06A-2000	**$756.00**
	Custom Lengths	ERN06A	**$.43/ft.**
4 Conductors (2 Pairs)	500-ft. (152.4-m)	ERN04A-0500	**$139.95**
	1000-ft. (304.8-m)	ERN04A-1000	**$279.95**
	2000-ft. (609.6-m)	ERN04A-2000	**$558.95**
	Custom Lengths	ERN04A	**$.31/ft.**

Item		**Code**	**Price**
RS-232 Plenum Cable—Office Environment, PVC Jacket			
25 Conductors (12½ Pairs)	500-ft. (152.4-m)	EYN25A-0500	**$1211.00**
	1000-ft. (304.8-m)	EYN25A-1000	**$2422.00**
	2000-ft. (609.6-m)	EYN25A-2000	**$4844.00**
	Custom Lengths	EYN25A	**$2.69/ft.**
12 Conductors (6 Pairs)	500-ft. (152.4-m)	EYN12A-0500	**$574.00**
	1000-ft. (304.8-m)	EYN12A-1000	**$1133.00**
	2000-ft. (609.6-m)	EYN12A-2000	**$2248.00**
	Custom Lengths	EYN12A	**$1.19/ft.**
4 Conductors (2 Pairs)	500-ft. (152.4-m)	EYN04A-0500	**$254.00**
	1000-ft. (304.8-m)	EYN04A-1000	**$493.00**
	2000-ft. (609.6-m)	EYN04A-2000	**$969.00**
	Custom Lengths	EYN04A	**$.52/ft.**

The Black Box Advantage—Bulk RS-232 Cable for Short Runs Less Than 50 ft!

Bulk Standard RS-232 Cable

Standard RS-232 Cable Cut to the Length You Need.


ECN12A

SPECIFICATIONS

Cable Type — Gray PVC
Capacitance — 50 pF/ft.
Conductor Gauge — 22 AWG (7 x 30 AWG), stranded
Resistance — Less than 16 ohms/1000 ft.
Shield — None

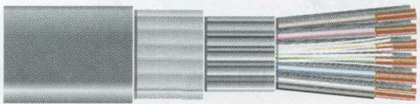
- RS-232 transmission up to 50 ft. (15.2 m).
- Unshielded data cable.
- 4-, 7-, 12-, 16-, and 25-conductor cables.

Item	Code	Price
Bulk Standard RS-232 Cable		
25 Conductors (12½ Pairs)		
500-ft. (152.4-m)	ECN25A-0500	**$319.95**
1000-ft. (304.8-m)	ECN25A-1000	**$639.95**
2000-ft. (609.6-m)	ECN25A-2000	**$1278.95**
Custom Lengths	ECN25A	**$.71/ft.**
16 Conductors (8 Pairs)		
500-ft. (152.4-m)	ECN16A-0500	**$220.95**
1000-ft. (304.8-m)	ECN16A-1000	**$441.95**
2000-ft. (609.6-m)	ECN16A-2000	**$882.95**
Custom Lengths	ECN16A	**$.49/ft.**

Item	Code	Price
12 Conductors (6 Pairs)		
500-ft. (152.4-m)	ECN12A-0500	**$166.95**
1000-ft. (304.8-m)	ECN12A-1000	**$333.95**
2000-ft. (609.6-m)	ECN12A-2000	**$666.95**
Custom Lengths	ECN12A	**$.37/ft.**
7 Conductors (3½ Pairs)		
500-ft. (152.4-m)	ECN07A-0500	**$103.95**
1000-ft. (304.8-m)	ECN07A-1000	**$207.95**
2000-ft. (609.6-m)	ECN07A-2000	**$414.95**
Custom Lengths	ECN07A	**$.23/ft.**
4 Conductors (2 Pairs)		
500-ft. (152.4-m)	ECN04A-0500	**$72.95**
1000-ft. (304.8-m)	ECN04A-1000	**$144.95**
2000-ft. (609.6-m)	ECN04A-2000	**$288.95**
Custom Lengths	ECN04A	**$.16/ft.**

Bulk Individually Shielded Twisted-Pair Cable

Send Data up to 50 Feet (15.2 m) in an Industrial Setting.


ESN12A

SPECIFICATIONS

Cable Type — Twisted pair, gray PVC jacket
Capacitance — 30 pF/ft.
Conductor Gauge — 22 AWG (7 x 24 AWG), stranded
Resistance — 16 ohms/1000 ft. (max.)
Shield — Foil around each pair, each with a drain wire

- RS-232 transmission up to 50 ft. (15.2 m).
- Also for RS-422 and RS-485 interfaces—perfect for industrial applications.
- 4-, 6-, 12-, and 24-conductor cables.

Item	Code	Price
Bulk Individually Shielded Twisted-Pair Cable (with Drain Wire)		
24 Conductors (12 Pairs)		
500-ft. (152.4-m)	ESN24A-0500	**$630.00**
1000-ft. (304.8-m)	ESN24A-1000	**$1260.00**
2000-ft. (609.6-m)	ESN24A-2000	**$2519.00**
Custom Lengths	ESN24A	**$1.40/ft.**

Item	Code	Price
12 Conductors (6 Pairs)		
500-ft. (152.4-m)	ESN12A-0500	**$361.00**
1000-ft. (304.8-m)	ESN12A-1000	**$727.00**
2000-ft. (609.6-m)	ESN12A-2000	**$1453.00**
Custom Lengths	ESN12A	**$.80/ft.**
6 Conductors (3 Pairs)		
500-ft. (152.4-m)	ESN06A-0500	**$194.00**
1000-ft. (304.8-m)	ESN06A-1000	**$388.00**
2000-ft. (609.6-m)	ESN06A-2000	**$775.00**
Custom Lengths	ESN06A	**$.44/ft.**
4 Conductors (2 Pairs)		
500-ft. (152.4-m)	ESN04A-0500	**$146.00**
1000-ft. (304.8-m)	ESN04A-1000	**$291.00**
2000-ft. (609.6-m)	ESN04A-2000	**$582.00**
Custom Lengths	ESN04A	**$.32/ft.**

Bulk Flat (Ribbon) Cable

Use Flat Cable Where Normal Round Cable Won't Fit.

- For RS-232 or parallel interfaces.

SPECIFICATIONS

Cable Type — PVC flat ribbon
Capacitance — 14 pF/ft.
Conductor Gauge — 28 AWG (7 x 36 AWG), stranded
Resistance — 67.5 ohms/1000 ft.
Shield — None
Spacing — 0.05" RS-422, RS-485

- Supports short runs of a few feet.

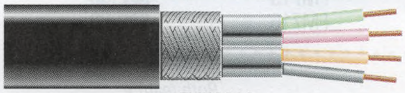
Item	Code	Price
Bulk Flat (Ribbon) Cable, 100-ft. (30.5-m) Spool		
50 Conductors	EY248A	**$111.95**
37 Conductors	EY242A	**$82.95**
36 Conductors	EY244A	**$72.95**
25 Conductors	EY230A	**$53.95**
15 Conductors	EY241A	**$34.95**
9 Conductors	EY240A	**$22.95**

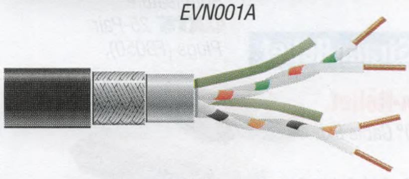
EY240A

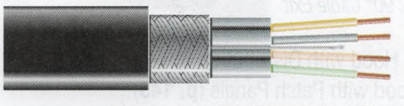
For Crimp Tools, **see pp. 156–158.**

Token Ring Bulk Cable

The Most Popular Token Ring Cables.


EVN001A


EVN005A


EVN009A

- Ideal cables for IBM® Token Ring, broadband video, and CDDI.

NOTE: If you don't see what you need, ask. Other cables are available.

SPECIFICATIONS

Attenuation — At 100 MHz, 37.5 dB/1000 ft.
Capacitance — 8.5 pF/ft. (27.9 pF/m)
Conductor Gauge — EVN005A: 26 AWG;
All Others: 22 AWG
Conductor Material — Solid copper
Construction — All: 2 shielded twisted pairs
Jacket Material — EVN001A, EVN005A, EVN009A, EVN011A: PVC;
EVN002A, EVN010A: PVC alloy
Maximum Outside Diameter (Nominal) —
EVN001A: 0.47" (11.9 mm);
EVN002A: 0.50" (12.7 mm);
EVN005A: 0.39" (9.9 mm);
EVN009A: 0.33" (8.4 mm);
EVN010A: 0.30" (7.6 mm)
NEXT — At 100 MHz, 38.5 dB/1000 ft.
Nominal Cable Weight — 100 lb./1000 ft.
Velocity of Propagation — 78%

Item	Code	Price
Token Ring Type A Bulk Cable (IEEE 802.5)/150-ohm Shielded Twisted Pair (STP)		
Type 1—4 Conductors (2 Pairs)		
PVC 500-ft. (152.4-m)	EVN001A-0500	**$214.00**
1000-ft. (304.8-m)	EVN001A-1000	**$427.00**
Plenum		
500-ft. (152.4-m)	EVN002A-0500	**$485.00**
1000-ft. (304.8-m)	EVN002A-1000	**$969.00**
Type 6—4 Conductors (2 Pairs)		
PVC 500-ft. (152.4-m)	EVN005A-0500	**$189.00**
1000-ft. (304.8-m)	EVN005A-1000	**$377.00**
Type 1A—4 Conductors (2 Pairs)		
PVC 500-ft. (152.4-m)	EVN009A-0500	**$224.95**
1000-ft. (304.8-m)	EVN009A-1000	**$449.95**
Custom Lengths	EVN009A	**$.50/ft.**
Plenum		
500-ft. (152.4-m)	EVN010A-0500	**$463.95**
1000-ft. (304.8-m)	EVN010A-1000	**$926.95**
Custom Lengths	EVN010A	**$1.03/ft.**

High-Performance CAT5 Modular Plugs

Easy Load System *Simplifies* Cable Termination!

- Exceeds EIA/TIA 568A requirements for CAT5 four-pair (RJ-45) UTP applications.
- Exceeds NEXT requirements for Category 5.
- Load bar eases wire insertion while maintaining ½" twist requirements.

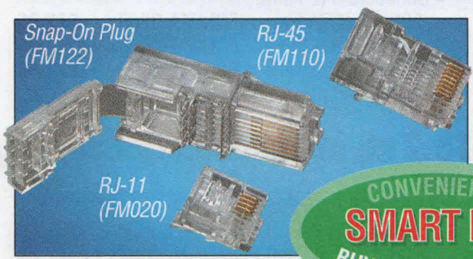
PLUS! Modular Testers, **see pp. 203–204.**

Item	Code	Price
High-Performance Modular Plugs (25/Bag)		
Stranded Conductor		
Unshielded	FM730	**$32.95**
Shielded	FM731	**$69.95**
Solid Conductor		
Unshielded	FM732	**$32.95**
Shielded	FM733	**$69.95**
You may also need:		
Ethernet Quick Check	TS030A	**$99.95**
Crimp Tools		**See pages 156–158.**

FAXBACK INFORMATION
Request Document Number: 14364
Call 412-746-5500 Anytime

RJ-11, RJ-45, and MMJ Modular Connectors

Connectors for Your Modular Telephone or LAN.



CONVENIENCE
SMART PAK
BUY IN BULK & SAVE!

Item	Code	Price
Modular Connectors, Special-Application		
Snagless RJ-45 Plug (Pack of 10)	FM120	**$12.99**
Snap-On Plug		
RJ-11, 6-Wire (Pack of 10)	FM121	**$39.99**
RJ-45, 8-Wire (Pack of 10)	FM122	**$39.99**
RJ-22 Handset Modular Plugs (Pack of 25)	FM101	**$5.99**

Item	Code	Price
You may also need:		
Snagless Plug Crimp Tool	FT050	**$149.99**
Ethernet Quick Check	TS030A	**$99.95**
Crimp Tools		**See pages 156–158.**
For Modular Testers, see pp. 203–204.		

FAXBACK INFORMATION
Request Document Number: 14364
Call 412-746-5500 Anytime

Item	Single		10-Pack		25-Pack		50-Pack		100-Pack	
Modular Connectors, RJ-11										
4-Wire	FM020	**$.59**	FM020-10PAK	**$5.59**	FM020-25PAK	**$13.95**	FM020-50PAK	**$23.95**	FM020-100PAK	**$45.95**
6-Wire	FM015	**$.79**	FM015-10PAK	**$7.59**	FM015-25PAK	**$17.95**	FM015-50PAK	**$33.95**	FM015-100PAK	**$65.95**
Modular Connectors, RJ-45, Oval Cable										
Stranded	FM010	**$.99**	FM010-10PAK	**$9.59**	FM010-25PAK	**$22.95**	FM010-50PAK	**$42.95**	FM010-100PAK	**$82.95**
Solid	FM110	**$1.09**	FM110-10PAK	**$10.59**	FM110-25PAK	**$24.95**	FM110-50PAK	**$46.95**	FM110-100PAK	**$90.95**
Modular Connectors, RJ-45, Round Cable										
Stranded	FM105	**$1.09**					FM106	**$39.95**		
Modular Connectors, MMJ	FM100	**$.89**	FM100-10PAK	**$8.59**	FM100-25PAK	**$20.95**	FM100-50PAK	**$38.95**	FM100-100PAK	**$74.95**

Color-Coded FlexPlugs and Pre-Plugs

Identify Patch Cords at a Glance.

FlexPlugs
Pre-Plugs

FAXBACK INFORMATION
Request Document Number: 12647
Call 412-746-5500 Anytime

- **For use with any RJ-45 modular cable.**
- **Simplify cable management and troubleshooting.**
- **Color-code user types and applications.**

PLUS! CAT5 Patch Cable, **see p. 69.**

FlexPlugs fit over your RJ-45 connectors for quick color coding. Slip Preplugs onto bulk cable before terminating connectors.

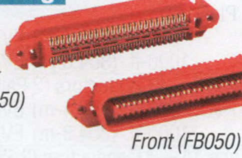
Item	Code (50-Pack)	Price
FlexPlugs (Pack of 50)		
Black	FM700	**$22.50**
Blue	FM701	**$22.50**
Green	FM702	**$22.50**
Gray	FM703	**$22.50**
Red	FM704	**$22.50**
Yellow	FM705	**$22.50**
White	FM706	**$22.50**

Item	Code (50-Pack)	Price
Pre-Plugs (Pack of 50)		
Black	FM710	**$22.50**
Blue	FM711	**$22.50**
Green	FM712	**$22.50**
Gray	FM713	**$22.50**
Red	FM714	**$22.50**
Yellow	FM715	**$22.50**
White	FM716	**$22.50**

25-Pair Terminations Are as Easy as 1-2-3!

CAT5 25-Pair Plug

1. Order Plugs.



This patented Plug provides power-sum crosstalk for multiple Category 5 applications.

Item	Code	Price
CAT5 25-Pair Plug	FB050	**$9.95**

Butterfly Tool

2. Terminate Cable.

Butterfly Tool (FT298) works with Category 5 and (3) 25-pair telco connectors.

Item	Code	Price
Butterfly Tool	FT298	**$849.95**
Color-Code Bar	FT299	**$26.95**

Hoods with Strain-Relief

Both feature CAT5 25-Pair Plugs (FB050).

3. Add Strain-Relief.

FB060: 120° Cable Exit
FB055: 90° Cable Exit

Use the 90° Hood with Distribution Boxes; use the 120° Hood with Patch Panels (**p. 145**).

Item	Code	Price
Hoods with Strain-Relief		
90° Hood	FB055	**$.95**
120° Hood	FB060	**$1.95**

In This Section...
Terminated Cable
Bulk Cable

Deluxe Modular Plug Kit

Here's the Complete Kit for Repairing or Installing RJ-Type Modular Plugs.

The Deluxe Modular Plug Kit is designed for anyone who repairs or installs RJ-type modular plugs. The Kit includes a Deluxe Modular Plug Termination Tool which acts as a cable cutter, cable jacket stripper, and smooth ratchet for full connector termination. It has a cushioned grip and spring-actuated handles for maximum operator comfort. You can use the Termination Tool with four-, six-, and eight-position line-cord connector plugs by switching the die included in the Kit.

FAXBACK INFORMATION
Request Document Number: 18856
Call 412-746-5500 Anytime

What's in the Deluxe Modular Plug Kit:

- Deluxe Modular Plug Termination Tool
- (1) 4- to 6-position die set (RJ-11)
- (1) 8-position die set (RJ-45)
- (25) 4-position plugs
- (25) 6-position plugs
- (25) 8-position plugs
- Compact metal box (1.5"H x 11.5"W x 8"D, 4 lb.)

Item	Code	Price
Deluxe Modular Plug Kit	FTM600	$214.95

CAT5 Modular Plug Kit

All You Need for Category 5 Plug Repairs and Installations.

- **Category 5 die set exceeds EIA/TIA 568A and TSB-40A requirements for 4-pair RJ-45.**
- **Load bar maintains ½" twist prior to termination so it's easy to use.**

When making repairs or installations on your Category 5 8-position modular plugs, make sure you have everything you need at your side. The termination tool cuts and crimps Category 5 modular plug connectors. It also acts as a cable cutter and cable jacket stripper. Its smooth ratchet gives you full connector termination and the cushioned grip and spring-actuated handles make the Tool easy to hold. Use the ratchet release to disengage the ratchet during faulty terminations.

What's in the CAT5 Modular Plug Kit:

- (1) Deluxe modular plug termination tool (See Tool description **above**.)
- (1) Category 5 4-pair UTP die set
- (100) Solid 8-position high-performance Category 5 modular plugs
- Compact metal box (1.5"H x 11.5"W x 8"D, 4 lb.)

FAXBACK INFORMATION
Request Document Number: 18863
Call 412-746-5500 Anytime

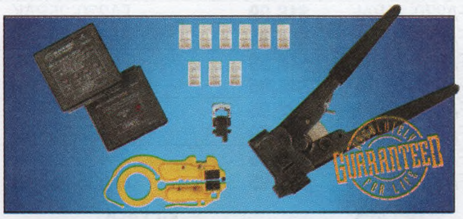
Item	Code	Price
CAT5 Modular Plug Kit	FTM650	$214.95

CAT5 Termination Kits

Do-It-Yourselfers—Order These CAT5 Kits for BIG Savings!

What's in the CAT5 Termination Kit:

- (1) Multi Quick Check Tester
- (1) Multi-Strip Cable Stripper
- (1) Modular Crimp Tool
- (25) Category 5 RJ-45 Plugs
- (1) Crimp Die for Modular Jacks



Our *best* CAT5 tools—*guaranteed for life.* Install or terminate cable ***perfectly*** and ensure compliance with the Category 5 standard.

Item	Code	Price
CAT5 Termination Kit	FT470A	$289.95

FAXBACK INFORMATION
For Termination Kit: 16359,
For Installation Kit: 16366
Call 412-746-5500 Anytime

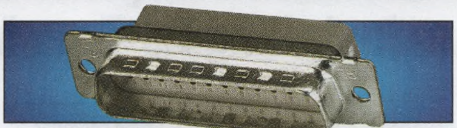
Save Even More!

Get everything listed in the **CAT5 Termination Kit *PLUS*** 500 feet of Category 5 Cable (4-pair Solid PVC). Guaranteed for Life. Guaranteed Savings!

Item	Code	Price
CAT5 Installation Kit	FT471A	$349.95

Everything You Need to Make a Flawless D-Shell Connection.

Crimp Shells



CONVENIENCE SMART PAK BUY IN BULK & SAVE!

- Accepts snap-in type pins.

Item		Single		10-Pack		25-Pack		50-Pack	
Crimp Shells									
DB9	Male	FA110	$1.49	FA110-10PAK	$13.95	FA110-25PAK	$35.59	FA110-50PAK	$68.95
	Female	FA120	$1.49	FA120-10PAK	$13.95	FA120-25PAK	$35.59	FA120-50PAK	$68.95
DB15	Male	FA210	$1.59	FA210-10PAK	$14.95	FA210-25PAK	$37.95	FA210-50PAK	$73.95
	Female	FA220	$1.59	FA220-10PAK	$14.95	FA220-25PAK	$37.95	FA220-50PAK	$73.95
DB25	Male	FA010	$.99	FA010-10PAK	$9.59	FA010-25PAK	$23.59	FA010-50PAK	$45.95
	Female	FA020	$.99	FA020-10PAK	$9.59	FA020-25PAK	$23.59	FA020-50PAK	$45.95
DB37	Male	FA310	$1.99	FA310-10PAK	$18.95	FA310-25PAK	$47.59	FA310-50PAK	$92.95
	Female	FA320	$1.99	FA320-10PAK	$18.95	FA320-25PAK	$47.59	FA320-50PAK	$92.95
DB50	Male	FA410	$2.95	FA410-10PAK	$27.95	FA410-25PAK	$69.95	FA410-50PAK	$135.95
	Female	FA420	$2.95	FA420-10PAK	$27.95	FA420-25PAK	$69.95	FA420-50PAK	$135.95

Item		Single		10-Pack		25-Pack		50-Pack		100-Pack	
Crimp Pins	Male	FA810	$.19	FA810-10PAK	$1.59	FA810-25PAK	$4.59	FA810-50PAK	$8.95	FA810-100PAK	$17.95
	Female	FA820	$.19	FA820-10PAK	$1.59	FA820-25PAK	$4.59	FA820-50PAK	$8.95	FA820-100PAK	$17.95
Insertion/Extraction Tool		FT020	$2.95								

Solder Shells

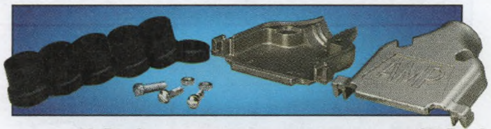
CONVENIENCE SMART PAK BUY IN BULK & SAVE!

- Back features solder contact points for wires.

Item		Single		10-Pack		25-Pack		50-Pack	
Solder Shells									
DB9	Male	FB110	$1.95	FB110-10PAK	$18.59	FB110-25PAK	$46.59	FB110-50PAK	$90.95
	Female	FB120	$1.95	FB120-10PAK	$18.59	FB120-25PAK	$46.59	FB120-50PAK	$90.95
DB15	Male	FB210	$2.59	FB210-10PAK	$24.59	FB210-25PAK	$61.59	FB210-50PAK	$119.95
	Female	FB220	$2.59	FB220-10PAK	$24.59	FB220-25PAK	$61.59	FB220-50PAK	$119.95
DB25	Male	FB010	$2.49	FB010-10PAK	$23.59	FB010-25PAK	$58.95	FB010-50PAK	$114.95
	Female	FB020	$2.49	FB020-10PAK	$23.59	FB020-25PAK	$58.95	FB020-50PAK	$114.95
DB37	Male	FB310	$3.29	FB310-10PAK	$30.95	FB310-25PAK	$77.95	FB310-50PAK	$151.95
	Female	FB320	$3.29	FB320-10PAK	$30.95	FB320-25PAK	$77.95	FB320-50PAK	$151.95
DB50	Male	FB410	$7.95	FB410-10PAK	$75.59	FB410-25PAK	$188.95	FB410-50PAK	$369.95
	Female	FB420	$9.95	FB420-10PAK	$94.59	FB420-25PAK	$235.95	FB420-50PAK	$459.95

Item		Single		10-Pack		25-Pack		50-Pack		100-Pack	
Solder Socket Pins											
	Male	FA830	$.19	FA830-10PAK	$1.59	FA830-25PAK	$4.59	FA830-50PAK	$8.95	FA830-100PAK	$17.95
	Female	FA840	$.29	FA840-10PAK	$2.79	FA840-25PAK	$6.95	FA840-50PAK	$13.95	FA840-100PAK	$27.95

Hoods



CONVENIENCE SMART PAK BUY IN BULK & SAVE!

- Choose plastic or metal EMI/RFI shielded hoods.

Item		Single		10-Pack		25-Pack		50-Pack	
Hoods									
DB9	Plastic	FA130	$1.95	FA130-10PAK	$18.59	FA130-25PAK	$45.95	FA130-50PAK	$89.95
	EMI/RFI	FA032	$4.95	FA032-10PAK	$46.95	FA032-25PAK	$116.95	FA032-50PAK	$229.95
DB15	Plastic	FA230	$1.95	FA230-10PAK	$18.59	FA230-25PAK	$45.95	FA230-50PAK	$89.95
	EMI/RFI	FA033	$6.95	FA033-10PAK	$65.95	FA033-25PAK	$164.95	FA033-50PAK	$322.95
DB25	Plastic	FA030	$1.95	FA030-10PAK	$18.59	FA030-25PAK	$45.95	FA030-50PAK	$89.95
	EMI/RFI	FA031	$4.95	FA031-10PAK	$46.95	FA031-25PAK	$115.95	FA031-50PAK	$225.95
DB37	Plastic	FA330	$2.45	FA330-10PAK	$22.95	FA330-25PAK	$57.95	FA330-50PAK	$112.95
	EMI/RFI	FA034	$5.95	FA034-10PAK	$56.59	FA034-25PAK	$140.95	FA034-50PAK	$275.95
DB50	Plastic	FA430	$2.55	FA430-10PAK	$23.95	FA430-25PAK	$59.95	FA430-50PAK	$116.95
	EMI/RFI	FA035	$8.95	FA035-10PAK	$84.95	FA035-25PAK	$210.95	FA035-50PAK	$412.95

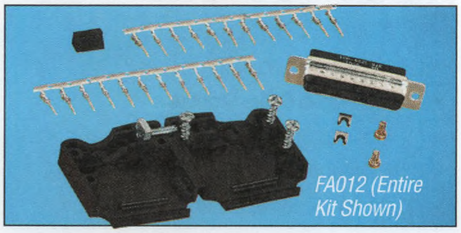
Item		Single		10-Pack		25-Pack		50-Pack		100-Pack	
Screw Locks	Male	FA910	$.39	FA910-10PAK	$3.59	FA910-25PAK	$9.59	FA910-50PAK	$18.59	FA910-100PAK	$37.95
	Female	FA920	$.89	FA920-10PAK	$8.59	FA920-25PAK	$20.95	FA920-50PAK	$40.95	FA920-100PAK	$80.95

RS-232 Connector Kit

Fast, Trouble-Free RS-232 Connections.

Everything you need for a quick, secure RS-232 connection: one DB25 crimp shell, one hood, 25 crimp snap pins, and a set of screw locks.

Item	Code	Price
RS-232 Connector Kit		
Male	FA012	$4.95
Female	FA022	$4.95

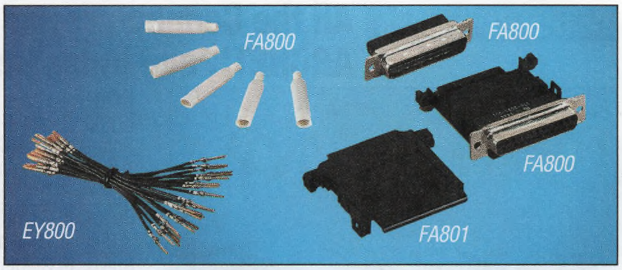


FA012 (Entire Kit Shown)

In This Section...
Terminated Cable
Bulk Cable

Two-Headed Hood Kit

Make Custom Pinnings on the Spot.



What's in the Two-Headed Hood Kit:

(2) Connectors	(1) Full Set of Prepinned Leads
(1) Hood Assembly	

CONVENIENCE
SMART PAK
BUY IN BULK & SAVE!

Item	Code	Price
Two-Headed Hood Kit		
Male/Female	FA800	**$17.95**
Male/Male	FA802	**$17.95**
Female/Female	FA804	**$17.95**

Item	Single		10-Pack		25-Pack	
Two-Headed Hood (Cover Only)	FA801	**$2.95**	FA801-10PAK	**$27.95**	FA801-25PAK	**$69.95**
Additional 2-inch Wire with Precrimped Pins (Specify Gender: Female/Female, Female/Female, Male/Female-Male/Male)	EY800	**$.29**			EY800-25PAK	**$6.95**

For Crimp Tools, **see pp. 156–158.**

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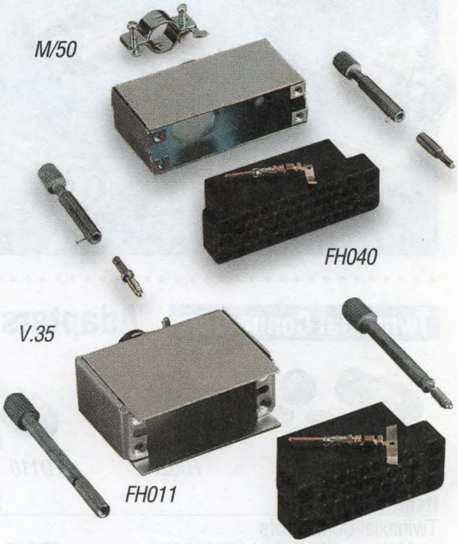
V.35 and M/50 Custom Pinning Equipment

Create Your Own Custom Pinning for V.35 and M/50.

CONVENIENCE
SMART PAK
BUY IN BULK & SAVE!



Item			Single		10-Pack		25-Pack	
Connector Shells								
V.35	Male		FH011	**$1.49**	FH011-10PAK	**$13.95**	FH011-25PAK	**$34.95**
	Female		FH021	**$1.49**	FH021-10PAK	**$13.95**	FH021-25PAK	**$34.95**
M/50	Male		FH040	**$2.59**	FH040-10PAK	**$24.59**	FH040-25PAK	**$62.95**
	Female		FH050	**$2.59**	FH050-10PAK	**$24.59**	FH050-25PAK	**$62.95**
Connector Hoods								
V.35			FH031	**$5.95**	FH031-10PAK	**$56.95**	FH031-25PAK	**$139.95**
M/50			FH060	**$5.95**	FH060-10PAK	**$56.95**	FH060-25PAK	**$139.95**
Screw Locks								
V.35			FH301	**$4.95/set**	FH301-10PAK	**$46.95/set**	FH301-25PAK	**$119.95/set**
M/50	(1) M, (1) F		FH300	**$4.95/set**	FH300-10PAK	**$46.95/set**	FH300-25PAK	**$119.95/set**
Crimp Tool			FT012	**$119.00**				
V.35, M/50 Pin Extraction Tool			FT016	**$14.95**				

Item		Single		10-Pack		25-Pack		50-Pack		100-Pack	
Pins	Male	FH100	**$.39/ea.**	FH100-10PAK	**$3.89**	FH100-25PAK	**$9.59**	FH100-50PAK	**$18.95**	FH100-100PAK	**$35.95**
	Female	FH200	**$.39/ea.**	FH200-10PAK	**$3.89**	FH200-25PAK	**$9.59**	FH200-50PAK	**$18.95**	FH200-100PAK	**$35.95**

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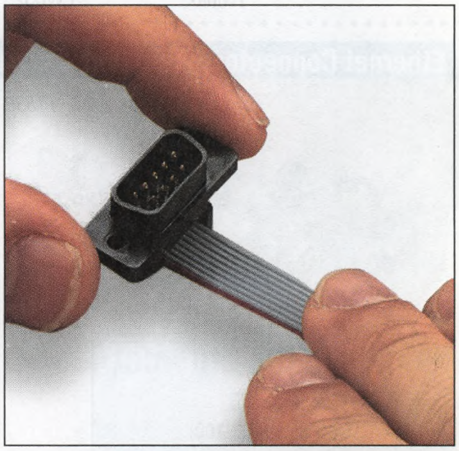
Ribbon Cable Connectors

Sure Termination for Ribbon Cabling.

CONVENIENCE
SMART PAK
BUY IN BULK & SAVE!

- No-fault installation on all types of standard multiconductor ribbon cables.
- Plastic insulation displacement connectors—requires no stripping.
- Compact and neat—easy to manipulate and install. See **page 123** for Bulk Flat (Ribbon) Cable.



Item	Male Single	Female Single	Single Price	Male 10-Pack	Female 10-Pack	10-Pack Price
Ribbon Cable Connectors						
DB9	FG105	FG100	**$4.95**	FG105-10PAK	FG100-10PAK	**$46.95**
DB15	FG115	FG110	**$5.95**	FG115-10PAK	FG110-10PAK	**$55.95**
DB25 (RS-232)	FG125	FG120	**$6.95**	FG125-10PAK	FG120-10PAK	**$65.95**
DB37 (RS-449)	FG135	FG130	**$9.95**	FG135-10PAK	FG130-10PAK	**$93.95**
DB50	FG145	FG140	**$19.95**	FG145-10PAK	FG140-10PAK	**$188.95**
36-Contact Centronics® Type	FG150	FG151	**$9.95**	FG150-10PAK	FG151-10PAK	**$93.95**
50-Contact Telco	FG155	FG156	**$11.95**	FG155-10PAK	FG156-10PAK	**$112.95**

PLUS! Connector Kits, Insulated Terminal Kits, and Wire Nuts, **see p. 155.**

CONVENIENCE
SMART PAK
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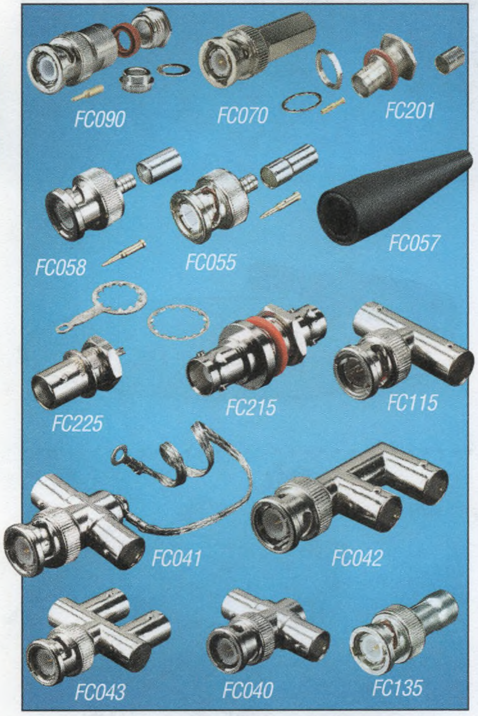
Coaxial Connectors

All the Connectors and Components You Need for 3270, ARCNET®, and Video Installations.



Item	Single		10-Pak	
Crimp Coaxial Connectors (RG59/62), BNC (Male/Indoor)	FC050	**$2.95**	FC050-10PAK	**$27.95**
Solder Coaxial Connectors, BNC (Male/Indoor)	FC090	**$3.95**	FC090-10PAK	**$37.95**
Twist-On Coaxial Connectors (for RG59/62), BNC (Male/Indoor)	FC070	**$2.95**	FC070-10PAK	**$27.95**
Bulkhead Crimp Coaxial Connectors, BNC (Female/Bulkhead Jack/Indoor)	FC201	**$5.95**	FC201-10PAK	**$56.59**
Bulkhead Solder Coaxial Connector BNC (Bulkhead Jack)	FC225	**$2.95**	FC225-10PAK	**$28.95**
Feed-Thru Coaxial Connectors, BNC				
(Double Female Bulkhead Jack/Indoor)	FC215	**$6.95**	FC215-10PAK	**$65.95**
Insulation Bushing 9/16"	FC211	**$.57**	FC211-10PAK	**$5.59**
Coaxial Cable Matchers (Female/Female, BNC)	FC200	**$2.95**	FC200-10PAK	**$27.95**
BNC Resistor Terminator Caps				
RG59 Cap, 75-Ohm	FC235	**$14.95**	FC235-10PAK	**$141.95**
RG62 Cap, 93-Ohm (with Nylon Retainer)	FC240	**$14.95**	FC240-10PAK	**$141.95**
Without Resistor (Ball-Chain Retainer)	FC140	**$10.95**	FC140-10PAK	**$104.95**
BNC 50-Ohm Terminator with Strap	FC044	**$5.40**	FC044-10PAK	**$51.59**
RG58 Connectors				
BNC (PVC)	FC058	**$2.90**	FC058-10PAK	**$27.59**
Crimp-Type (Plenum)	FC055	**$2.95**	FC055-10PAK	**$27.59**
ThinNet Insulator Boot	FC057	**$.50**	FC057-10PAK	**$4.59**
Coaxial T Connectors (Nonbulkhead)				
BNC Auto T-Connector F-M-F	FC040	**$9.95**	FC040-10PAK	**$94.59**
F-M-F with Strap	FC041	**$12.95**	FC041-10PAK	**$122.95**
BNC F-Connector	FC042	**$7.95**	FC042-10PAK	**$75.59**
BNC Y-Connector	FC043	**$7.95**	FC043-10PAK	**$75.59**
BNC T-Connector (Jack-Plug-Jack, FMF)	FC115	**$8.95**	FC115-10PAK	**$84.95**
BNC Resistor Terminator Caps, RG58 Cap, 50-Ohm	FC135	**$14.95**	FC135-10PAK	**$141.95**
LAN Tool Kit 100				**See page 158.**

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CONVENIENCE
SMART PAK
BUY IN BULK & SAVE!

Twinaxial Connectors

Adapters and Connectors for Twinaxial Equipment.

FD010
FD020
FD110
EW030
FD050
FD030
FD115

Item		Single		10-Pack	
Twinaxial Connectors					
Male	*(IBM® Part #7362229)*	FD010	**$9.95**	FD010-10PAK	**$94.59**
Female	*(IBM Part #7362179)*	FD015	**$17.95**	FD015-10PAK	**$169.95**
Twinaxial Bulkhead Feed-Through		FD110	**$17.95**	FD110-10PAK	**$169.95**
Female		FD020	**$7.95**	FD020-10PAK	**$75.59**
Twinax Strap 'N' T	DB15	EW030	**$45.95**		
	Twinax	EW032	**$45.95**		

Item	Code	Price
Twinaxial Cable Matcher, F/F	FD050	**$19.95**
Twinaxial T Connectors		
Jack-Plug-Jack (FMF)	FD030	**$51.95**
Jack-Jack-Jack (FFF)	FD100	**$51.95**
Twinaxial Termination Cap	FD115	**$19.95**

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Ethernet Connectors, Terminators, and Connector Kits

Here's Everything for Ethernet Connections.

What's in the Ethernet Connector Kit:

- (2) Barrel Connectors (LN100)
- (8) Male Series N Connectors (LN110)
- (2) Female Series N Connectors (LN115)
- (2) Male Line Terminators (LN130)
- (2) Female Line Terminators (LN135)

$ave when you buy the Kit!

CONVENIENCE
SMART PAK
BUY IN BULK & SAVE!

FT551
LN100
LN110
LN115
LN130
LN135

- The Transceiver Connector Kit contains everything needed to terminate an 802.3 DB15 connector.

Item		Single		10-Pack	
Ethernet Connector Kit (Coaxial)		FT830	**$117.95**		
Transceiver Connector Kit, DB15	Male	FA550	**$14.95**	FA550-10PAK	**$141.95**
	Female	FA551	**$14.95**	FA551-10PAK	**$141.95**
N-Type Barrel Connector		LN100	**$7.95**	LN100-10PAK	**$75.59**
Standard N-Type Connectors	Male	LN110	**$5.95**	LN110-10PAK	**$56.69**
	Female	LN115	**$11.95**	LN115-10PAK	**$113.59**
N-Type Terminators	Male	LN130	**$9.95**	LN130-10PAK	**$94.59**
	Female	LN135	**$9.95**	LN135-10PAK	**$94.59**

Colored Modular Adapters

Color-Code Your UTP System!

- Adapt DB25 RS-232 ports to RJ-45 or RJ-12 modular jacks.
- Simplify management and troubleshooting by color-coding your applications.
- Ultra-slim, single-piece hood for tight-clearance applications.
- Unassembled kit.

NOTE: For other D-shell adapters, call Tech Support.

SPECIFICATIONS

Gold Plating — 10-µin. thickness
Housing — ABS and Fiberglas®, UL®, 94VO
Lead Wire — UL®, 26 AWG, 7 strands, 3"L (7.6 cm)

FAXBACK INFORMATION
Request Document Number: 12654
Call 412-746-5500 Anytime

Item	Code	Code	Price
Colored Modular Adapters			
DB25/RJ-45	DB25 Male	DB25 Female	
Red	FA730	FA740	**$8.95**
Green	FA731	FA741	**$8.95**
Blue	FA732	FA742	**$8.95**
Yellow	FA733	FA743	**$8.95**
Gray	FA734	FA744	**$8.95**
DB25/RJ-12	DB25 Male		
Red	FA735	—	**$8.95**
Green	FA736	—	**$8.95**
Blue	FA737	—	**$8.95**
Yellow	FA738	—	**$8.95**
Gray	FA739	—	**$8.95**

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Modular Adapters: Standard, Thumbscrew, and ATP

Convert ATP Connections to Modular.

- Made for your HP3000™.
- Convert RS-232 3-pin and RS-422 5-pin interfaces for modular connectors.
- ATP 3-Pin Adapter converts 3-pin RS-232 male to RJ-11.
- ATP 5-Pin Adapter converts 5-pin RS-422 male to RJ-45.
- With our Modular Adapter Kits and Thumbscrew Adapters, convert DB9, DB15, and DB25 interfaces to RJ-11 or RJ-45.

PLUS! We can preassemble or prepin these Adapters to meet your specifications. See the Custom Modular Adapter Form between **pp. 66 and 67.**

NOTE: The standard Modular Adapters mount in a blank patch panel; the Thumbscrew Adapters do not.

FA024

FA770

FJ058

FJ060

Item			Code	Price
Modular Adapter Kits (Unassembled)				
DB9	M↔RJ-45 F	(8-Wire)	FA066	**$8.95**
	F↔RJ-45 F	(8-Wire)	FA065	**$8.95**
DB15	M↔RJ-45 F	(8-Wire)	FA061	**$8.95**
	F↔RJ-45 F	(8-Wire)	FA060	**$8.95**
DB25	M↔RJ-11 F	(4- or 6-Wire)	FA024	**$8.95**
	F↔RJ-11 F	(4- or 6-Wire)	FA026	**$8.95**
	M↔RJ-45 F	(8-Wire)	FA025	**$8.95**
	F↔RJ-45 F	(8-Wire)	FA027	**$8.95**

Item			Code	Price
Modular Adapters (Assembled)				
DB25	M↔RJ-11 F	(4- or 6- Wire)	FA017	**$9.95**
	F↔RJ-11 F	(4- or 6-Wire)	FA018	**$9.95**
	M↔RJ-45 F	(8-Wire)	FA015	**$9.95**
	F↔RJ-45 F	(8-Wire)	FA016	**$9.95**
ATP Modular Adapters				
Male (ATP 3 to RJ-11)			FJ058	**$23.95**
Male (ATP 5 to RJ-45)			FJ060	**$25.95**

Item			Code	Price
Modular Thumbscrew Adapter Kits				
DB9	M↔RJ-45 F	(8-Wire)	FA755	**$9.95**
	F↔RJ-45 F	(8-Wire)	FA756	**$9.95**
DB25	M↔RJ-11 F	(4- or 6-Wire)	FA751	**$9.95**
	F↔RJ-11 F	(4- or 6-Wire)	FA752	**$9.95**
	M↔RJ-45 F	(8-Wire)	FA770	**$9.95**
	F↔RJ-45 F	(8-Wire)	FA771	**$9.95**

NOTE: In price chart, RJ- end is always female (F).

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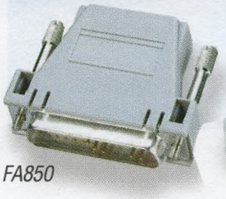
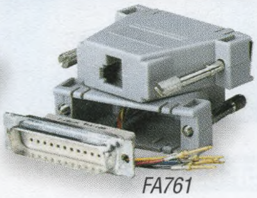
MMJ Modular Adapter Kits

Make All Your DEC Connections with Our MMJ Modular Adapter Kits.


FA850


FA761

- Use terminals and printers that have DB9 or DB25 ports with your DECconnect™ wiring scheme.

Item		DEC™ Part #	Code	Price
DB25 Male to MMJ Female	for VT300™ Terminals	*(H8751C)*	FA850	**$15.95**
	for LJ250 Color Printers	*(H8571E)*	FA852	**$15.95**
DB25 Female to MMJ Female	for Terminals	*(H8571A)*	FA851	**$15.95**
DB9 Female to MMJ Female	for Printer Connections	*(H8571B)*	FA853	**$15.95**
DB9↔MMJ Adapter Kit	Male		FA765	**$12.95**
	Female		FA766	**$12.95**
DB25↔MMJ Adapter Kit	Male		FA761	**$12.95**
	Female		FA762	**$12.95**

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Data Connectors

Terminate Your IBM Type A Cable.

Data Connector (FJ010)

Enhanced Data Connector (FJ011)

Enhanced Data Connector

- 300-MHz bandwidth—triple that of Category 5 UTP specifications.
- For high-performance STP-A applications.
- Special design means fewer parts and simplified assembly.
- Convenient smaller size.

Data Connector

- Self-shorting contacts help with diagnostic checkouts.
- Snap it together and set it inside a junction box, or mount it in a distribution panel.
- A color-coded wire mount within the box keeps your wires matched up during assembly.

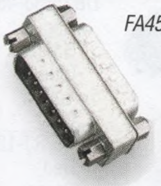
Item	Code	Price
Enhanced Data Connector *(IBM® Part #73G7500)*	FJ011	**$21.95**
Data Connector *(IBM Part #8310574)*	FJ010	**$15.95**

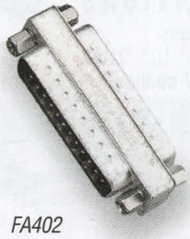
For Type A, Type 1, or Type 6 Bulk (STP) Cable, see p. 123.

Gender Changers (Series D and Centronics Compatible)

Instant Cable Gender Changers.

FA381


FA450


FA402

- **EMI/RFI shielding blocks out noise and interference to keep data signals clear.**
- **Immediate, convenient gender-matching.**

Here's the quick compatibility solution when you need to connect your laptop, PC, printer, or other peripherals and find the genders of the cables don't match.

Save your ports, too. If you're constantly plugging in and plugging out, extend the life of your ports considerably with a Gender Changer. It takes the heavy wear and protects your I/O board or motherboard.

Item		Male/Male	Female/Female	Price
Gender Changers				
DB9	(EMI/RFI Shielded)	FA440	FA445	**$10.95**
DB15	(EMI/RFI Shielded)	FA450	FA455	**$11.95**
DB25	(EMI/RFI Shielded)	FA402	FA412	**$11.95**
DB25	(Not Shielded)	TS400	TS410	**$11.95**
DB37	(EMI/RFI Shielded)	FA460	FA465	**$14.95**
DB37	(Not Shielded)		TS475	**$14.95**
DB50	(Not Shielded)	TS460	TS465	**$56.95**
HD15	(EMI/RFI Shielded)	FA452	FA454	**$14.95**
Telco	(EMI/RFI Shielded)	FA474	FA476	**$24.95**
Centronics® Compatible		FA381	FA382	**$35.95**
	(EMI/RFI Shielded)	FA470	FA472	**$19.95**

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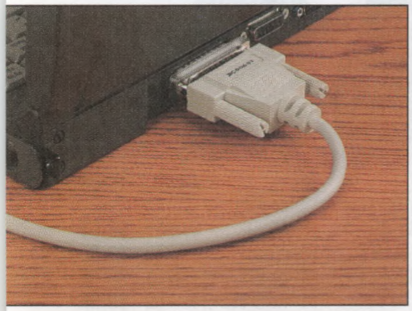
Port Protectors

Protect Your Laptop's Ports from the Stress of Plugging and Unplugging.



FA650

FA651

FA652

- Extend the life of equipment connectors.
- They take the beating of constantly plugging and unplugging connectors.

FAXBACK INFO
Request Document Number: 15592
Call 412-746-5500
Anytime

Item		Code	Price
Port Protectors	DB9	FA650	**$9.95**
	DB15	FA651	**$10.95**
	DB25	FA652	**$13.95**
$ave when you order the Combo Pack!		FA653	**$41.95**

Combo Pack includes one DB9, one DB15, and two DB25 Port Protectors.

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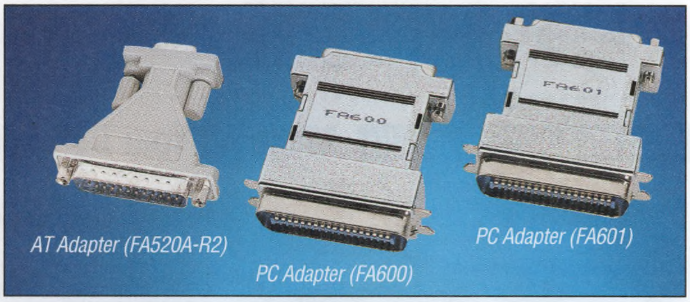
Parallel PC and Serial AT Adapters

Handy Plug-In Alternatives to Special IBM AT and PC Connector Cables.

Item	Code	Price
AT® Adapter (Serial)		
DB9 Female to DB25 Male	FA520A-R2	**$11.95**
DB9 Male to DB25 Female	FA521A	**$10.95**
PC Adapter (Parallel)		
DB25 Male to Centronics Male	FA600	**$11.95**
DB25 Female to Centronics Male	FA601	**$11.95**


AT Adapter (FA520A-R2) *PC Adapter (FA600)* *PC Adapter (FA601)*

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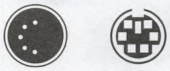
IBM PC Keyboard Adapters

Get Plugged In and Adapt.

- The simple solution for incompatible connectors.
- Use a full-size keyboard with your notebook computer.


5-Pin DIN 6-Pin Mini DIN

Use the FA211 to connect an AT keyboard to an IBM® PS/2®.

Use the FA212 to connect a PS/2 keyboard to an IBM AT.

Item	Code	Price
IBM PC Keyboard Adapters		
5-Pin DIN Female to 6-Pin Mini DIN Male	FA211	**$5.95**
6-Pin Mini DIN Female to 5-Pin DIN Male	FA212	**$5.95**

Sun 13W3 to HD15F Adapter

Connect Your Sun Workstation to a VGA Screen.

- **Connect your Sun Workstation® to a standard VGA monitor.**
- **13W3 male connector to an HD 15-pin female connector.**

The new BLACK BOX® Sun 13W3 to HD15F Adapter has a 13W3 male Sun® connector on one side to plug into the workstation and an HD 15-pin female VGA connector on the other side to connect to your VGA screen.

PLUS! SCSI Adapters, see p. 97.

Item	Code	Price
Sun 13W3 to HD15F Adapter	ACD002	**$34.95**

CAT5 Coupler

Join Category 5 Patch Cords and Maintain Category 5 Performance.

remember to order cables

For CAT5 Cable, **see pp. 68–69, 114–115.**

New

- **Couple two or more Category 5 patch cables—and still transmit at 100 Mbps.**
- **Great for temporary links.**
- **Make absolutely secure connections.**
- **Easy installation. Just feed cable through, then lock in place.**
- **Good for either T568A or T568B wiring applications.**

Why buy and install new Category 5 cable? Just couple the cable you already have. With this new CAT5 Coupler, you can join Category 5 cable and extend your cable run—without losing Category 5 speed! Now you can save the cost of new cable and make hassle-free moves, additions, and changes.

You can even put the CAT5 Coupler to good use when testing cable. Prolong the life of your PentaScanner or other cable tester jack. Plug in the CAT5 Coupler instead.

SPECIFICATIONS

Modular Jack — RJ-45 with captive pin
Size — 1.2"H x 0.7"W x 1.9"D (3 x 1.8 x 4.6 cm)

PLUS! Fiber Optic Adapters, **see p. 76.**

Item	Code	Price
CAT5 Coupler	FM500	**$12.95**

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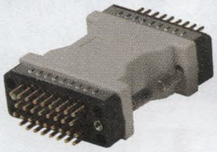
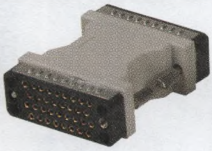
V.35 Gender Changers

V.35 Gender Changers Have Arrived! Get Them First at Black Box.

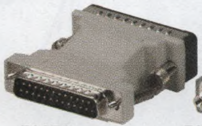


FA052



FA054

FA056



FA058

FA059

New

- Molded construction for durability.
- Protect ports from overuse and damage.
- Match V.35 to V.35 or to RS-232 (DB25).

Black Box Explains...

Pinning for V.35 to RS-232 Gender Changers.

FA056 PIN-OUT

P1	P2
A	1
B	13
C	5
D	7
E	9
F	10
P	2
R	4
S	15
T	17
U	11
V	6
W	24
X	19
Y	3
AA	16

FA058 PIN-OUT

P1	P2
A	1
B	7
E	6
C	4
D	5
F	8
H	20
P	2
S	14
R	3
T	16
U	24
V	17
W	11
X	9
Y	15
AA	12

FA059 PIN-OUT

P1	P2
A	1
B	7
C	4
D	5
E	6
F	8
H	20
P	2
R	3
S	14
T	16
U	24
V	17
W	11
X	9
Y	15
AA	12

Item	Code	Price
V.35 Gender Changers		
V.35 to V.35		
Male/Male	FA052	**$39.95**
Female/Female	FA054	**$43.95**
V.35 to RS-232 (DB25)		
Female/Male	FA056	**$19.95**
Female/Male	FA058	**$19.95**
Male/Female	FA059	**$19.95**

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Ethernet Adapter Bracket, Latch Adapter, and Connector Saver

Keep Your Existing Ethernet Interface Card, Thanks to These AUI Accessories.

- **Ethernet Adapter Bracket stops your AUI cable from pulling away from your 3Com transceiver card.**
- **Hexnut to Slide Latch Adapter makes your AUI cable and your Network Interface Card compatible and locks them together.**
- **Ethernet Connector Saver keeps your AUI connectors fresh.**

You don't have to replace your 3Com® Ethernet interface card. Use the Adapter Bracket and plug into a standard transceiver cable connector.

With the Hexnut to Slide Latch Adapter, you can join a cable with locking posts to an interface card with hex nuts.

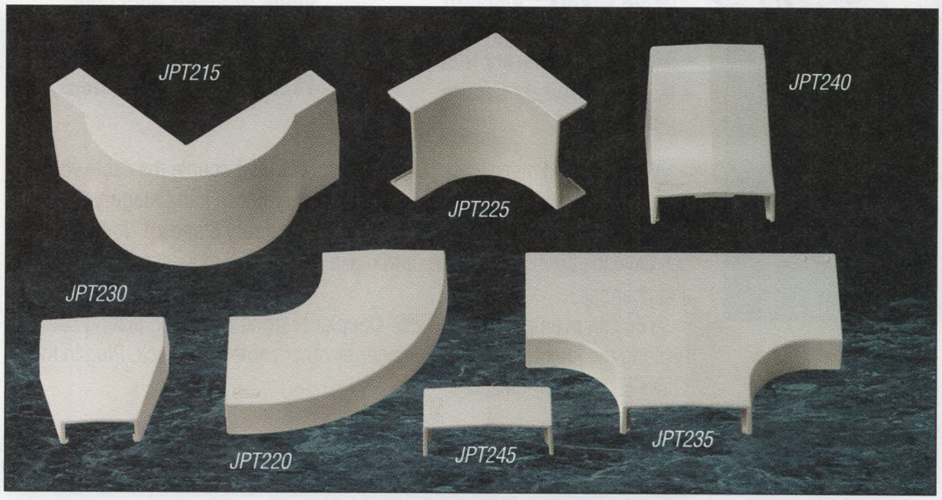
Protect your equipment investment. The Connector Saver keeps your AUI connectors from wearing out.

Ethernet Adapter Bracket (FA459) *Hexnut to Slide Latch Adapter (FA458)* *Ethernet Connector Saver (FA457)*

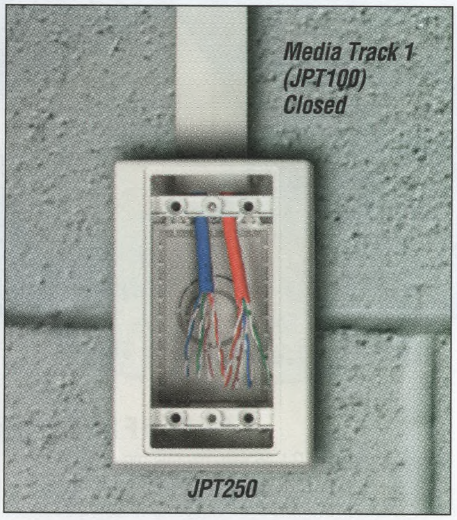
Item	Code	Price
Ethernet Adapter Bracket (10-Pack)	FA459	**$19.95**
Hexnut to Slide Latch Adapter	FA458	**$9.95**
Ethernet Connector Saver	FA457	**$9.95**

Media Track Systems

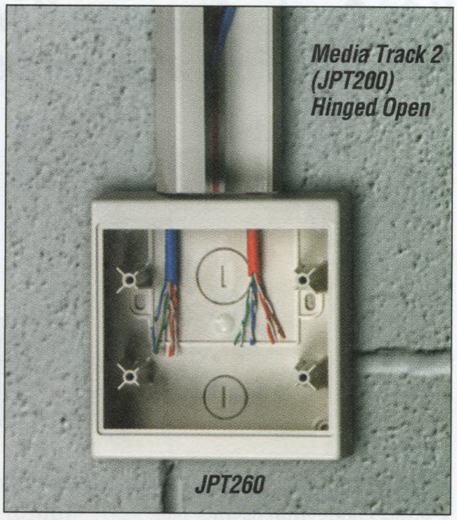
Run Cable along Concrete or Brick Walls in These Durable Surface-Mount Raceway Systems.



Use these fittings to run your Media Track around corners, etc.



The Media Track makes running cables along your concrete walls a snap.



The Media Track snaps open for easy installation.

- **Paintable and stainable.**
- **Adhesive-backed.**
- **Available in a variety of sizes and profiles.**
- **Available in single- or multi-channel.**
- **Non-metallic so they're lightweight and nonconductive.**
- **Full line of outlet boxes, plates, and fittings.**

If you have an older building with cinder-block or plaster walls, Black Box offers a better solution for managing your cables. Instead of running sloppy-looking cables along the floor, use our Media Track line of delivery systems to keep your voice and data lines safely off the floor. You can cut and paint these durable Raceway Systems so they blend in with the rest of your office. They have a patented two-piece design that hinges open and closed and an adhesive backing so they're easy to install!

Black Box also offers HD Jacks and Flush Wallplates. Our HD Jacks exceed EIA/TIA requirements. And our Flush Wallplates provide you with plenty of room to grow—they're fully compatible with the HD Jacks (see **pages 138–139**).

Item	Code	Price
Media Track 1, 1.23" (3.1-cm) Wide		
Base and Cover, 7-ft. (2.1-m) Length, Single	JPT100	$12.95
End Cap	JPT110	$1.29
External Elbow	JPT115	$1.95
Flat Elbow	JPT120	$1.95
Internal Elbow	JPT125	$1.95
Tee Cover	JPT135	$2.49
Conduit Adapter	JPT140	$4.45
Splice Cover	JPT145	$.95

FAXBACK INFORMATION
Request Document Number: 16397
Call 412-746-5500 Anytime

Item	Code	Price
Media Track 2, 2.16" (5.5-cm) Wide		
Base and Cover, 7-ft (2.1-m) Length, Double	JPT200	$19.95
End Cap	JPT210	$1.95
CAT5 External Elbow	JPT215	$4.95
CAT5 Flat Elbow	JPT220	$1.95
CAT5 Internal Elbow	JPT225	$1.95
Reducer	JPT230	$3.49
CAT5 Tee Cover	JPT235	$2.49
CAT5 Ceiling Adapter	JPT240	$2.49
Splice Cover	JPT245	$.95
Single-Gang Box, Standard Depth 1.91"	JPT250	$4.95
Single-Gang Box, Standard Depth 1.63"	WP276	$5.95
Double-Gang Box	JPT260	$9.95

remember to order cables
CAT5 Cables, see pp. 68–69, 114–116.

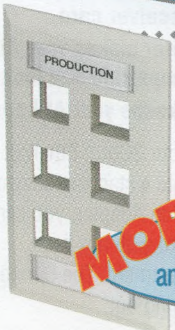
Flush Wallplates

You get plenty of room to grow with these Flush Wallplates designed for our new HD (High-Density) Jacks and Snap Fittings.

Mount the Wallplate in a Surface-Mount Box (as shown on **page 140**) or in a standard wall outlet.

Item	Code	Price
Single Gang (Office White)		
1-Port	WP250	$3.95
2-Port	WP251	$3.95
3-Port	WP252	$3.95

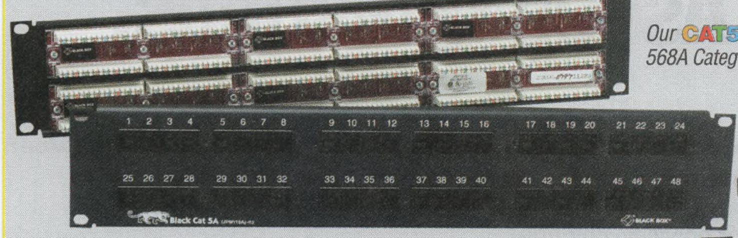
Item	Code	Price
Single Gang (Office White)		
4-Port	WP253	$3.95
6-Port	WP270	$3.95
Double Gang (Office White)		
6-Port	WP271	$4.49



MORE! CAT5 Outlets and Jacks, see pp. 138–139.

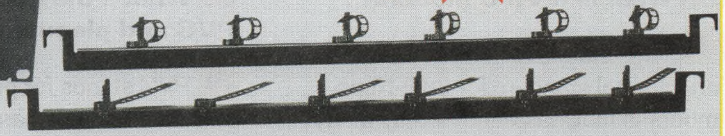
• NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ •

Patch Panels CAT5 and Category 3 Perfect for High-Speed Voice and Data Transmissions.



Our CAT5 Patch Panels exceed 568A Category 5 standards!

Rock-Bottom Prices!

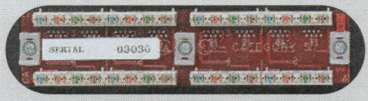


remember to order cables

Patch Cables, see p. 69.

1 2 3 4 5 6 7 8
Black Cat 5B (JPM110A)

Close-up: JPM110A-R2, front view, with Color Icons installed.



Close-up: JPM110A-R2, back view.

CAT5 Patch Panels:

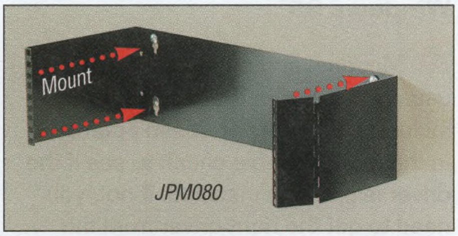
- CAT5 Patch Panels come with Cable Management Bar!
- Higher printed-circuit-board capacity.
- High port density—16, 24, 32, 48, 64, or 96 ports.
- Sturdy—rolled-edge anodized aluminum.
- Flushmount jack noses don't protrude so you won't snag cables when you're working in the wiring closet.
- A paired punch sequence allows a pair twist within ½" of termination.

Category 3 Patch Panels:

- Perfect for 10-Mbps UTP voice and data applications.
- Support 24 or 48 ports.
- Beryllium copper jacks with gold plating ensure superb connections.

Item	Size	Wiring	Code	Was	NOW!
CAT5 Patch Panels					
16-Port	1.8"H x 19"W x 1.6"D	568B	JPM110A-R2	~~$149.95~~	$114.95
	(4.6 x 48.3 x 4.1 cm)	568A	JPM115A-R2	~~$149.95~~	$114.95
24-Port	1.8"H x 19"W x 1.6"D	568B	JPM111A-R2	~~$199.95~~	$128.95
	(4.6 x 48.3 x 4.1 cm)	568A	JPM116A-R2	~~$199.95~~	$128.95
32-Port	3.5"H x 19"W x 1.6"D	568B	JPM112A-R2	~~$279.95~~	$194.95
	(8.9 x 48.3 x 4.1 cm)	568A	JPM117A-R2	~~$279.95~~	$194.95
48-Port	3.5"H x 19"W x 1.6"D	568B	JPM113A-R2	~~$359.95~~	$274.95
	(8.9 x 48.3 x 4.1 cm)	568A	JPM118A-R2	~~$359.95~~	$274.95
64-Port	7"H x 19"W x 1.6"D	568B	JPM120A	~~$459.95~~	$358.95
	(17.8 x 48.3 x 4.1 cm)	568A	JPM121A	~~$459.95~~	$358.95
96-Port	7"H x 19"W x 1.6"D	568B	JPM114A-R2	~~$659.95~~	$498.95
	(17.8 x 48.3 x 4.1 cm)	568A	JPM119A-R2	~~$659.95~~	$498.95
Category 3 Patch Panels					
24-Port	1.8"H x 19"W x 1.6"D	568B	JPM100A	~~$164.00~~	$115.95
	(4.6 x 48.3 x 4.1 cm)	568A	JPM102A	~~$164.00~~	$115.95
48-Port	3.5"H x 19"W x 1.6"D	568B	JPM101A	~~$302.00~~	$219.95
	(8.9 x 48.3 x 4.1 cm)	568A	JPM103A	~~$302.00~~	$219.95

Wallmount Patch Panel Brackets Rack 'em Up with These Easy-Install, Easy-Access Brackets.



Mount the Bracket where you want it! Universal hinging enables left or right opening.

- Mounts 2, 3, or 4 Patch Panels.
- Mount the Brackets where you want. Universal hinging enables left or right opening.
- Mount to the wall or any standard 19" rack. Brackets accept either 10/32" or 12/24" screws.
- Durable 16-gauge steel construction ensures a long life.
- All Brackets are 19" wide, and are 8" deep.

MORE! Racks, see pp. 161–169.

SPECIFICATIONS

Size — JPM082: 3.5"H x 19"W x 8"D (8.9 x 48.3 x 20.3 cm);
JPM081: 5.3"H x 19"W x 8"D (13.5 x 48.3 x 20.3 cm);
JPM080: 7"H x 19"W x 8"D (17.8 x 48.3 x 20.3 cm)

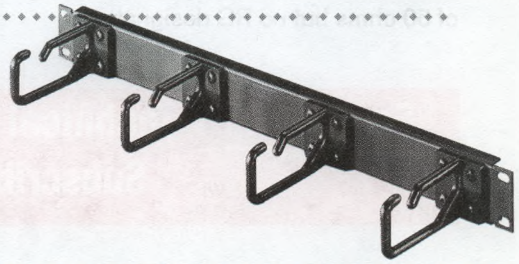
Item	Code	Price
Wallmount Patch Panel Brackets		
2 Patch Panels 3.5"H (8.9 cm)	JPM082	$21.00
3 Patch Panels 5.3"H (13.5 cm)	JPM081	$23.00
4 Patch Panels 7.0"H (17.8 cm)	JPM080	$25.00

Cable Manager Keep Cable Paths Organized.

SPECIFICATIONS

Size — JPM140A: 1.8"H x 19"W x 3.8"D (4.6 x 48.3 x 9.7 cm);
JPM141A: 3.5"H x 19"W x 3.8"D (8.9 x 48.3 x 9.7 cm)
Weight — JPM140A: 0.6 lb. (0.3 kg);
JPM141A: 1.1 lb. (0.5 kg)

Item	Code	Price
Cable Manager		
1.8-in. (4.6-cm)	JPM140A	$65.00
3.5-in. (8.9-cm)	JPM141A	$68.00



Updated Every Issue!

Our Experts Answer Your Commonly Asked Questions.

Q What is a V.FC modem?

A V.FC stands for V.Fast Class, an informal standard for 28.8-Kbps modems that was endorsed by many modem manufacturers before the ITU formally finalized the V.34 modem standard. It's important to note that V.FC is similar to V.34, but it's not 100% compatible.

Q What is a "POTS" line?

A POTS is an abbreviation for Plain Old Telephone Service, a slang term for a standard telephone network.

Q Please describe the different types of coaxial cable and what they're used for.

A Coaxial cable is made of insulated solid or stranded wire, surrounded by a solid or braided metallic shield, and enclosed in a plastic cover. There are many different types, most of which have RG designations: RG62, RG59, RG58, etc. What differentiates each type is its impedance rating and the kinds of equipment with which it can be used.

For example, RG62 cable has a 93-ohm impedance ratings and is normally used in ARCNET® or IBM® 3270 applications. RG59 cable, with a 75-ohm impedance rating, is used for cable TV, high-speed G.703 ports, or with WANG® and older IBM 3270 computers. RG58 cable has a 50-ohm impedance rating and is used for Thin Ethernet applications. Thick coax (standard Ethernet) also has an impedance rating of 50 ohms but no RG designation.

Q What's the difference between PVC and plenum-rated cable?

A PVC stands for polyvinyl chloride. This kind of cable has a jacket that gives off toxic fumes when it burns. Plenum cable has a flame-resistant jacket that doesn't emit toxic fumes, even if it does burn. According to the National Electrical Code® (established by the National Fire Protection Agency), plenum cable is approved for installation in structural air spaces called plenums.

Q What is a UART? I see it on modems and serial cards all the time.

A UART stands for Universal Asynchronous Receiver Transmitter. It's an electronic computer circuit that converts bytes to bits (and vice versa) for transmission via the serial port. Depending on the direction of the data flow, a UART either generates or strips the start and stop bits that frame each data byte.

Q What's the difference between IBM SNA and SDLC? Are they interchangeable terms?

A SNA and SDLC aren't interchangeable terms even though they're sometimes listed together as SNA/SDLC. SNA stands for Systems Network Architecture, which is an overall architecture for transmitting information. SDLC stands for Synchronous Data Link Control, a specific protocol used in IBM SNA networks.

Q What's the difference between a remote access server and a communication server?

A A remote access server gives incoming calls access to a LAN while a communication server provides access to LAN users to make outgoing calls to communication lines. Both servers provide remote connections via dialup or ISDN lines for a LAN. They're often simply referred to as access servers since most devices available today perform both functions.

Q What is SCSI?

A SCSI, pronounced skuzzy, stands for Small Computer Standard Interface. SCSI is a hardware interface standard for connecting small computers to peripherals such as disk drives, scanners, CD-ROMs, and printers. Each peripheral on the network has a unique identification.

Q I installed a new modem on my PC but I can't find the driver in the new connections list in Windows 95®.

A Modems and other peripherals usually come with the proper drivers included. If the driver doesn't come up in the menu, double check to see if the driver is properly installed. If not, you need to get the right driver from the manufacturer. The company can mail it to you, or if you have Internet access, you can get a software upgrade from its Web page. ◆

For the *BEST* Technical Information Every Month, Order *Connectivity NEWS*.℠
Subscribe TODAY—See Page 635 for Details.

Hinged Fold-Down Panels

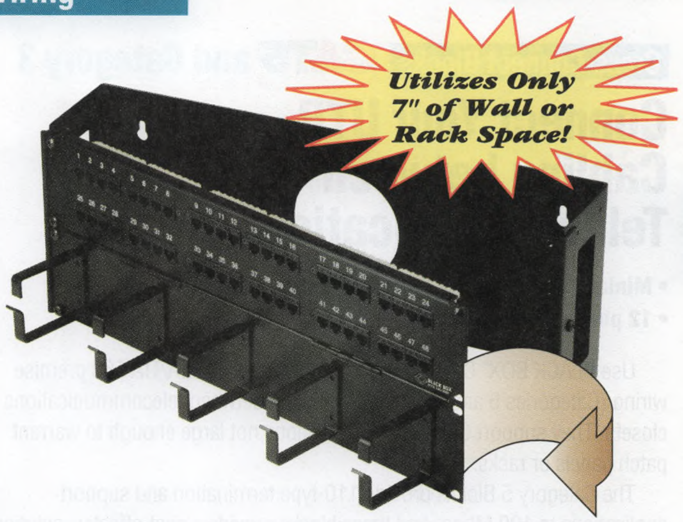
The Perfect Alternative to a Full-Size Rack.

- **48 CAT5 Ports.**
- **T568B wiring.**
- **Wall- or rackmountable.**
- **Only four rackmount-units (RMUs) high—great for high-density applications.**
- **Rackmount Panel folds down for use as a workbench—the Wallmount Panel swings out.**
- **¼" standoffs for vertical stacking.**
- **Inverted port numbers on the rear panel to identify ports when the panel is folded down.**

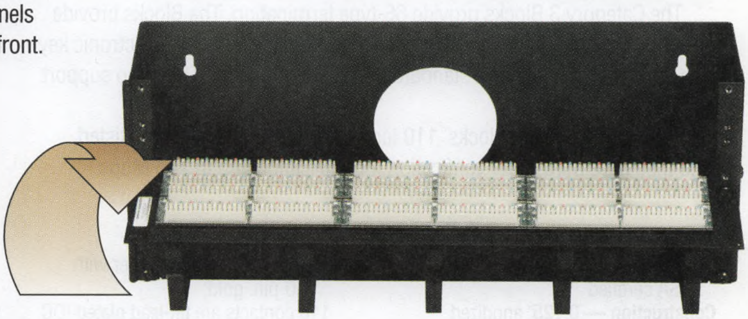
Why buy a full-size rack when you don't really need one? Here's the perfect alternative: The Hinged Fold-Down Panels serve as a bench to support a patch panel during termination. They're designed for convenience, too. The Rackmount Panels fold down and the Wallmount Panel swings open, giving you access from the front. And you can use their compact design to squeeze in multiple patch panels.

The Wallmount Panel features a 48-port patch panel hinged to a 3.5-inch cable-management panel with a wallmount bracket with cable entry points on both sides.

The Rackmount Panel has a 48-port patch panel hinged to the cable-management panel.



*Hinged Fold-Down Panel swings open (**above**) or folds down (**below**).*



SPECIFICATIONS

Size — JPM200A: 7"H x 19"W x 4"D (17.8 x 48.3 x 10.2 cm); JPM205A: 7"H x 19"W x 1.5"D (17.8 x 48.3 x 3.8 cm)

Weight — JPM200A: 8 lb. (3.6 kg); JPM205A: 4 lb. (1.8 kg)

FAXBACK INFO
Request Document Number: 17329
Call 412-746-5500
Anytime

VIPreview
Ask for our
CAT5 VIPreview.

Item	Code	Price
Hinged Fold-Down Panels		
Wallmount	JPM200A	**$479.95**
Rackmount	JPM205A	**$449.95**
(Does Not Include Wallmount Bracket)		

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CAT5 Coupler

Join Category 5 Patch Cords and Maintain Category 5 Performance.

PLUS! PentaScanners, **see pp. 196–197.**

- **Couple two or more Category 5 patch cables—and still transmit at 100 Mbps.**
- **Great for temporary links.**
- **Make absolutely secure connections.**
- **Easy installation. Just feed cable through, then lock in place.**
- **Good for either T568A or T568B wiring applications.**

Why buy and install new Category 5 cable? Just couple the cable you already have. With this CAT5 Coupler, you can join Category 5 cable and extend your cable run—without losing Category 5 speed! Now you can save the cost of new cable and make hassle-free moves, additions, and changes.

You can even put the CAT5 Coupler to good use when testing cable, too. Prolong the life of your PentaScanner or other cable tester jack. Plug in the CAT5 Coupler instead.

SPECIFICATIONS

Modular Jack — RJ-45 with captive pin

Size — 1.2"H x 0.7"W x 1.9"D (3 x 1.8 x 4.6 cm)

Item	Code	Price
CAT5 Coupler	FM500	**$12.95**
remember to order cables: Category 5 Patch Cable, 10-ft. (3.0-m) (Beige)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

Cross-Connect Blocks CAT5™ and Category 3

Connect Your UTP Cabling between Telecommunications Closets.

- **Miniature punchblock for small applications.**
- **12 ports, small footprint.**

Use BLACK BOX® Cross-Connect Blocks for your EIA/TIA 568 premise wiring (Categories 5 and 3) when connecting between telecommunications closets. They support Category 5 installations not large enough to warrant patch panels or racks.

The Category 5 Blocks provide 110-type termination and support applications to 100 Mbps. And these blocks provide a cost-effective solution for systems running 10BASE-T or Category 5. The paired punchdown sequence maintains twists of pairs to the point of termination.

The Category 3 Blocks provide 66-type termination. The Blocks provide an economical method of cross-connecting PBX Systems and electronic key systems using the industry standard 66-type termination. They also support Categories 3 and 4.

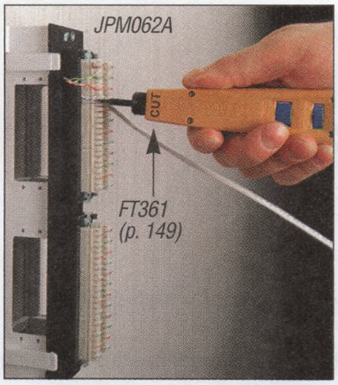
The Cross-Connect Blocks' 110 termination is UL® verified and listed. And they have third-party verification for applications up to 100 Mbps.

SPECIFICATIONS

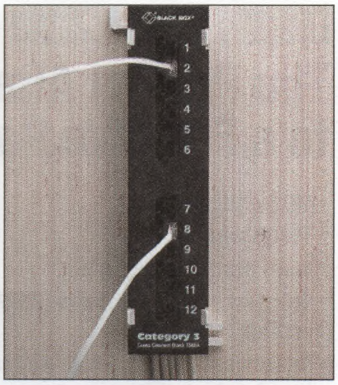
Compatibility — UL® 1863 listed, CSA certified

Construction — 0.125" anodized aluminum

Contacts — Beryllium copper with 50-µin. gold; 110 contacts are tin-lead plated IDC



Side view: Block being punched.



Front view: Block punched and ready to use.

The Blocks' sturdy printed-circuit-board design makes them easy to maintain and organize, and provides consistent, reliable electrical performance.

FAXBACK INFO
For All Items on this Page: 15169
Call 412-746-5500
Anytime

remember to order cables Bulk UTP Cabling, see pp. 114–116.

Item	Code	Price
CAT5 Cross-Connect Blocks (110-type)		
T568B Wiring	JPM051A	**$102.95**
T568A Wiring	JPM052A	**$102.95**
Category 3 Cross-Connect Blocks (66-type)		
T568B Wiring	JPM069A	**$79.95**
T568A Wiring	JPM062A	**$79.95**
remember to order cables Category 5 Solid Bulk Cable, 4-Pair, PVC		
500-ft. (152-m) (Beige)	EYN737A-0500	**$79.95**

For other lengths and colors, see pp. 114–115.

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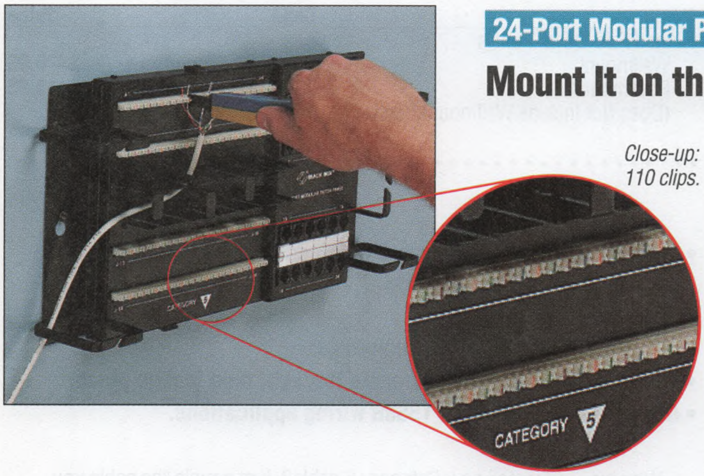
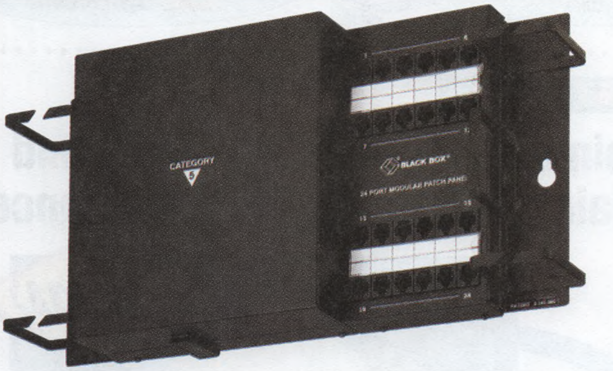
24-Port Modular Patch Panels CAT5™

Mount It on the Wall and Do Terminations from the Front!



Close-up: 110 clips.



When you're done, put the cover on for a tidy appearance and termination protection.

- **Total access from the front.**
- **Built-in cable management.**

It's easy to make terminations to 110 clips and eight-position modular jacks. Just mount the panel on the wall with its keyhole slots and take off the dust cover. It eliminates the need for racks and keeps your telecommunications closet less cluttered. The Panel exceeds all Category 5 transmission requirements for NEXT, attenuation, and return loss.

Built-in wire management eliminates cable stress. And removable yellow designation strips tell you where your cable is routed.

All cables plug into the front of the unit. Fields for terminating and cross-connecting are separate so you get fast installation and fast cable-patching—and save service time. A removable cover protects your terminations.

SPECIFICATIONS

Transmission — Exceeds Category 5 requirements for near-end crosstalk (NEXT), attenuation, and return loss as specified in TSB-40 standard

Wiring — T568B (Bell 258A) wiring pattern

Connectors — 8-position modular jacks; 110 clips

Size — 8.2"H x 17.8"W x 2.8"D (20.8 x 45.2 x 7.1 cm)

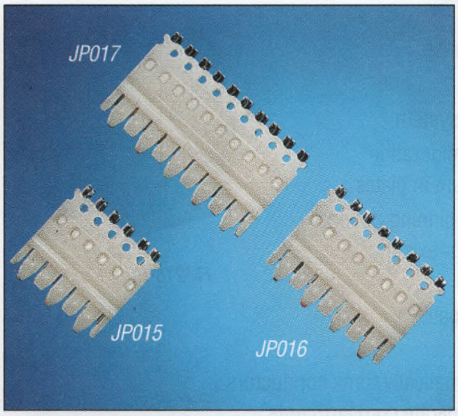
Weight — 3 lb. (1.4 kg)

Item	Code	Price
24-Port Modular Patch Panel	JPM085A	**$325.00**

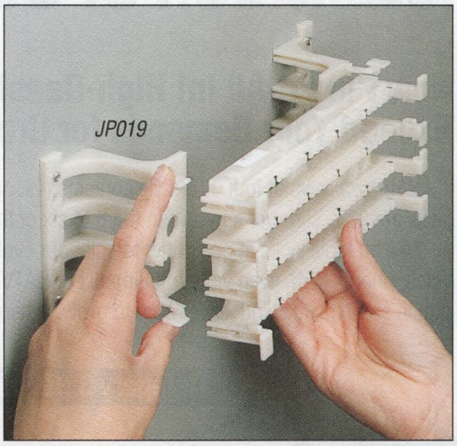
Wiring Blocks • Connecting Blocks • Splice Blocks

Doing Your Own Wiring?

Black Box Has the Interconnect Equipment You Need.



Connecting Blocks—Organization for color-coded wire. T&R markings designate Tip and Ring conductors and color-coded pairs. Used with our Wiring Blocks, they are fully compatible with AT&T® connectors. Terminate 22–26 AWG wire. Use Punchdown Block Tool FT362 (**page 149**) to terminate.

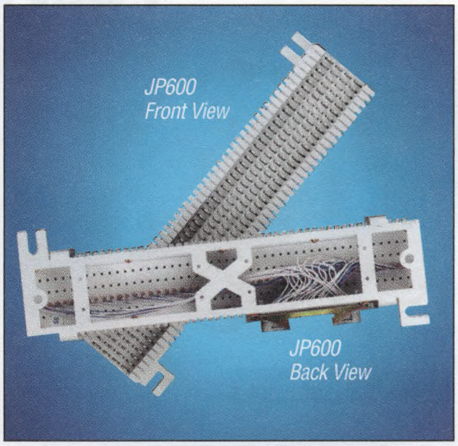


Wiring Blocks with Legs—Wiring strips are notched. Stand-off legs are detachable during installation. That makes it easy to install new cabling and handle subsequent moves and changes. Fully compatible with AT&T connectors and accessories.

SPECIFICATIONS

Compatibility — UL® 1863 listed, CSA certified
Construction — 0.125" anodized aluminum
Contacts — Beryllium copper with 50-μin. gold; 110 contacts are tin-lead plated IDC

Item	Code	Price
Wiring Blocks with Legs, CAT5 Type 110		
50-Pair	JP018	**$12.00**
100-Pair	JP019	**$22.00**
300-Pair	JP020	**$66.00**
Connecting Blocks CAT5		
3-Pair	JP015	**$.75**
4-Pair	JP016	**$.85**
5-Pair	JP017	**$.95**



Telco Splice Block—Break out in-house wiring quickly and neatly. Available in unwired and in prewired configurations. Use Punchdown Block Tool (FT361) (**page 149**) to terminate.

Item	Code	Price
Telco Splice Blocks (Category 3 Rated), Type 66		
25-Pair		
with 4 Connector Clips	JP600	**$9.95**
with 2 Connector Clips, Prewired (Female, Telco, 50-Pin)	JP601	**$31.95**
50-Pair		
with 4 Connector Clips	JP620	**$9.95**
with 2 Connector Clips, Prewired (Female, Telco, 50-Pin)	JP621	**$38.95**
Splice Block Cover (Protects Clip Field) for Telco Splice Block	JP640	**$1.95**
Stand-Off Bracket for Telco Splice Block	JP642	**$1.95**
Bridging Clips for Telco Splice Block (50 Pieces)	JP650	**$7.95**

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Test Adapters

Testing Connecting Blocks Is Easy.

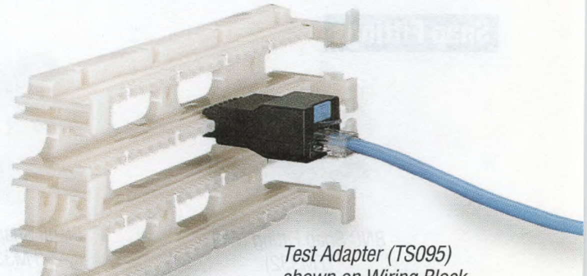
- **Convenient testing of terminated *and* unterminated connecting blocks.**
- **Spring-loaded contact design ensures reliable connections.**
- **Available in multiple configurations.**

Now there's a convenient way to test Category 5-rated connecting blocks—BLACK BOX® Test Adapters. The Adapters quickly and easily plug onto the connecting block and provide an 8-position modular jack for connection to test equipment or patch cords. And they attach to both terminated and unterminated connecting blocks.

You get reliable connections without disturbing existing cross-connect terminations. The Adapters are also end-stackable and polarized to prevent incorrect insertion.

Choose the Adapters you need for your specific applications: USOC, 10BASE-T, and those for T568A and T568B wiring configurations.

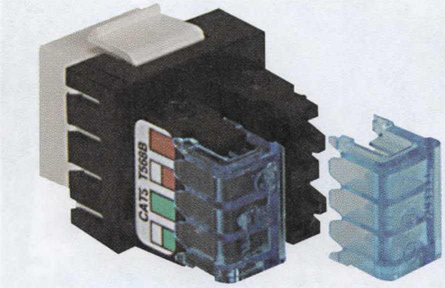
FAXBACK INFORMATION
Request Document Number: 14388
Call 412-746-5500 Anytime



Test Adapter (TS095) shown on Wiring Block with Legs (JP019)

Item		Code	Price
Test Adapters, Type 110, 1-, 2-, 3-, or 4-Pair to a RJ-45 Jack			
1-Pair	USOC	TS090	**$34.95**
2-Pair	10BASE-T	TS091	**$47.95**
	USOC	TS092	**$47.95**
3-Pair	USOC	TS093	**$47.95**
4-Pair	T568A	TS094	**$49.95**
	T568B	TS095	**$49.95**

Fast Installation of Cabling Outlets for



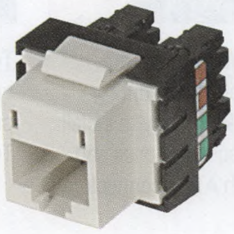
Now Plug It All In! High-Density Cable Components Exceed Your Demands for Greater Capacity.

With two rows of four 110-style contacts (vs. one row of eight), these CAT5 and **Category 3** jacks are 32% slimmer so you can fit up to six of them in a single-gang wallplate.

Mix multiple jacks in one outlet to suit your evolving office environment. Add **Snap Fittings** and run voice, phone, LAN, even video/multimedia or CATV—all to one wallplate. Or install a 6-port **Wallplate**, pop in some blanks and leave room to grow. When it's time to upgrade, your office will be ready.

CAT5 HD Jacks

- All jacks exceed EIA/TIA CAT5 requirements for high-quality, reliable service.
- UL® listed/CSA certified.
- Choose T568A or T568B pinning options to suit your cabling plan or existing premise wiring.
- Smaller High-Density configuration allows more jacks to mount in plates.
- Use with any Category 5 system.
- Beryllium copper contacts with 50-microinch gold plating ensure superior connectivity.
- Choose from seven colors.

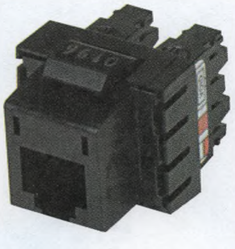


FM270

Item	RJ-45 T568B	RJ-45 T568A	Price
CAT5 HD Jacks			
Off-white	FM270	FM275	**$7.95**
Black	FM271	FM276	**$7.95**
Gray	FM272	FM277	**$7.95**
White	FM273	FM278	**$7.95**
Office White	FM274	FM279	**$7.95**
Red	FM280	FM281	**$7.95**
Blue	FM290	FM291	**$7.95**

Category 3 HD Jacks

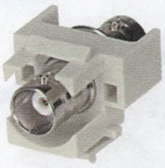
- Paired punchdown sequence.
- 110-style contacts.
- Use with any Category 3 system.
- Smaller High-Density configuration allows more jacks to mount in plates.
- Choose T568A or T568B pinning options to suit your cabling plan or existing premise wiring.
- Installs easily with just a pair of standard pliers.
- Installation process automatically trims conductors and isolates them into separate compartments.
- 50-microinch gold-plated contacts offer years of corrosion-free service.



FM218-R2

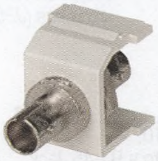
Item	RJ-45 T568B	RJ-45 T568A	6-Wire, RJ-11 USOC	8-Wire, RJ-45 USOC	Price
Category 3 HD Jacks					
Black	FM218-R2	FM226-R2	FM229-R2		**$5.95**
Office White	FM219-R2	FM227-R2	FM230-R2	FM224-R2	**$5.95**

Snap Fittings



BNC Snap Fitting (F/F) (FM332)

Blank Snap Fitting (FM330)



ST Adapter Snap Fitting (FM333)

F Connector Snap Fitting F/F (FM331)

Item	Code	Price
Blank Snap Fitting (Pack of 10)	FM330	**$4.49**
F Connector Snap Fitting (F/F)	FM331	**$3.49**
ST Adapter Snap Fitting	FM333	**$12.95**
BNC Snap Fitting (F/F)	FM332	**$9.95**

Category 5 and 3 Cable

Category 5 Patch Cable (Beige)
10-ft. (3.0-m) EVMSL05-0010
$10.95

For other lengths and colors, see p. 69.

Category 3 Solid Conductor Cable, 4-Pair, PVC, Straight, 568B Pinning
EYN730MS-MM
$6.95 + $.11/ft.

For other Category 3 cables, see p. 70.

EVMSL05

Custom Y Cable

Item		Code	Price
Custom Y Cable		EYN400	**$47.66**
Custom RS-232 Cable	1-ft. (0.3-m)	EDX04C-0001-FF	**$20.56**

PLUS! Media Track System, see p. 132.

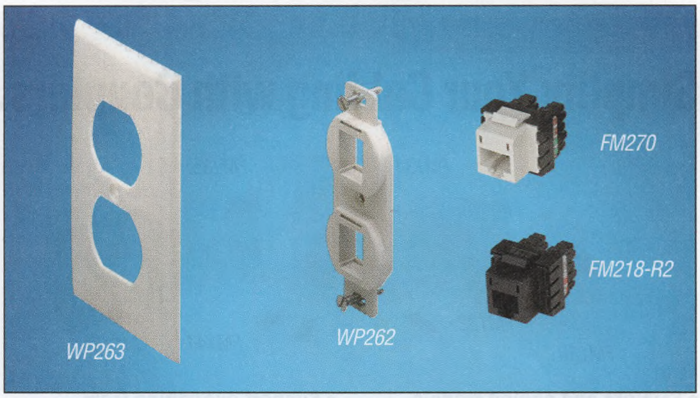
Category 3 and CAT5™—Here's All You Need.

Install CAT5™ Equipment Now for the High-Speed Transmissions You'll Need in the Future.

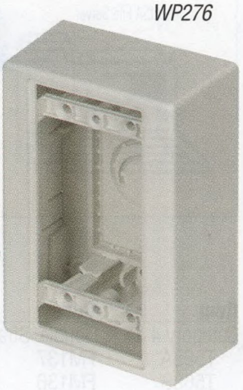
- **Install modular components without specialized tools.**
- **Make fast Category 5 and 3 connections.**
- **Standard 110 terminations.**

Standardizing your office wiring with modular components eliminates the need for fancy tools or special expertise. Ordinary screwdrivers and wirecutters are all you ever need.

Sturdy circuit-board technology exceeds EIA/TIA 568 specifications for reliable, fault-free 110 terminations.



Surface-Mount Housings & Adapters


WP276

WP274

For truly simple cable installation, stay out of those walls! Use the Surface-Mount Housing to hold your cable terminations, jacks, and anchor your faceplate securely to the outside of a wall.

Or, if you must go into the walls, use a Flush-Mount Adapter with flexible anchor arms to quickly set up a wallplate position on drywall without installing an electrical box.

Item	Code	Price
Surface-Mount Box (Off-White)		
Single-Gang 1.63" Deep	WP276	$5.95
1.91" Deep	JPT250	$4.95
Double-Gang 1.9" Deep	JPT260	$9.95
Flush-Mount Adapters		
Single-Gang	WP274	$1.95
Double-Gang	WP275	$2.95

Outlet Jack Frame & Wallplate

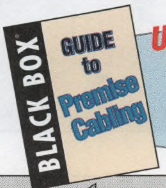
Frame
Use in standard electrical duplex wallboxes. For all modular jacks.

Nylon Wallplate
Standard single-gang size.

WP260

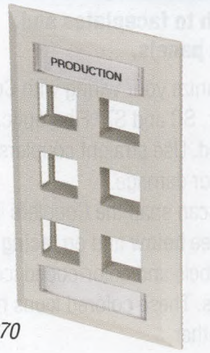
WP263

Item	Color	Code	Price
Outlet Jack Frame, 2 Jacks	Telco Ivory	WP260	$2.95
	Black	WP261	$2.95
	Office White	WP262	$2.95
Nylon Wallplate	Office White	WP263	$.95



Updated!
Make connections with our Guide to Premise Cabling.
See page 635.

Flush Wallplates



WP270

You get plenty of room to grow with these Flush Wallplates designed for our HD (High-Density) Jacks and Snap Fittings. Mount the Wallplate in a Surface-Mount Box (as shown on **page 140**) or in a standard wall outlet.

Item	Code	Price
Single-Gang (Office White)		
1-Port	WP250	$3.95
2-Port	WP251	$3.95
3-Port	WP252	$3.95
4-Port	WP253	$3.95
6-Port	WP270	$3.95

Item	Code	Price
Double Gang (Office White)		
6-Port	WP271	$4.49

Surface-Mount Housings

- **Side-exit cable connections require just 1.5" clearance.**
- **High-impact thermo-plastic really holds up.**

These unique little boxes house the Snap Fittings and HD Jacks shown on **p. 138**, but with a twist. The Jacks take cables fed in from the sides, to accommodate low-clearance environments. A perfect solution when you're up against the wall and nothing else will do.

ENGINEERING

FAXBACK INFO
Request Document Number: 16397
Call 412-746-5500
Anytime

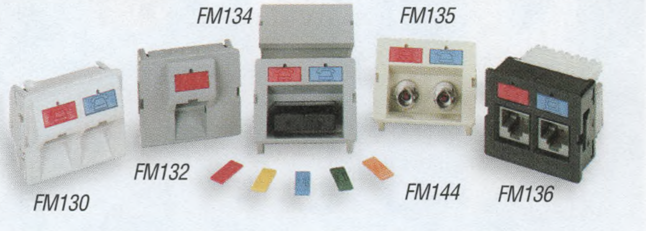
Item	Code	Price
Surface-Mount Housings (Office-White)		
2-Port	WP272	$4.49
4-Port	WP273	$4.95

PLUS!
Multimedia Outlet Boxes and Angled Wallplates
HOT NEW PRODUCTS

Finally! Comprehensive Cabling Organizers

Couplers & Accessories

Simplify Your Cabling with Couplers.



- **Straight and angled models.**
- **Attach to faceplates and patch panels.**
- **Support everything from modular to fiber cabling.**
- **Organize your cabling system.**

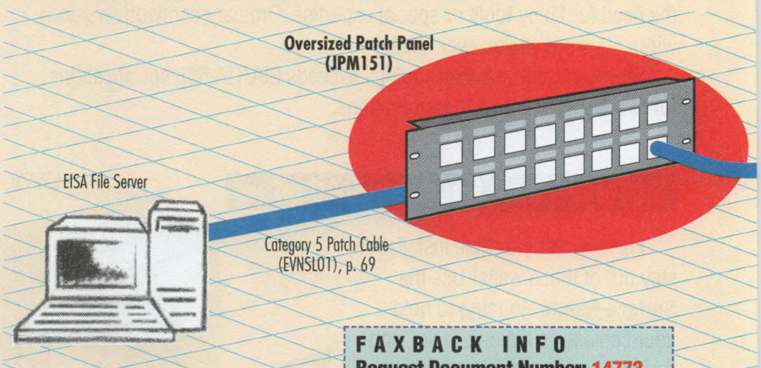
Organize your wiring with Couplers and Accessories. Choose Category 5 Modular, SC and ST® Fiberoptic, Ethernet, and Token Ring Couplers—straight or angled. Use straight couplers for patch panels. Angled couplers prevent connector damage.

You can snap the Couplers into a faceplate, surface-mount box, or patch panel (see **below** and on **facing page**). You can also get clear tabs with paper labels and color-coded icons, which snap into place on the front of the Couplers. These colored icons have a computer on one side and a telephone on the other.

Black Box Explains...

Category 5 Patch Panel Applications.

The products on these two pages are designed to organize and manage your horizontal cabling system. Many different combinations of accessories are possible so you get reliable connections for any application. Our Couplers support many cable types—Category 5 Modular, Fiberoptic, Coax. And they come in straight or angled versions. Our Furniture Adapters,



FAXBACK INFO
Request Document Number: 14773
Call 412-746-5500
Anytime

Item	Code	Price
Category 5 Jack, T568A, Double		
Black	FM130BL	**$16.95**
White	FM130WH	**$16.95**
Gray	FM130GR	**$16.95**
Ivory	FM130IV	**$16.95**
Category 5 Jack, T568B, Double		
Black	FM131BL	**$16.95**
White	FM131WH	**$16.95**
Gray	FM131GR	**$16.95**
Ivory	FM131IV	**$16.95**
Category 5 Jack, T568A, Single		
Black	FM132BL	**$8.95**
White	FM132WH	**$8.95**
Gray	FM132GR	**$8.95**
Ivory	FM132IV	**$8.95**

Item	Code	Price
Category 5 Jack, T568B, Single		
Black	FM133BL	**$8.95**
White	FM133WH	**$8.95**
Gray	FM133GR	**$8.95**
Ivory	FM133IV	**$8.95**
SC Fiber, Double, Angled		
Black	FM134BL	**$43.95**
White	FM134WH	**$43.95**
Gray	FM134GR	**$43.95**
Ivory	FM134IV	**$43.95**
ST Fiber, Double, Angled		
Black	FM135BL	**$22.95**
White	FM135WH	**$22.95**
Gray	FM135GR	**$22.95**
Ivory	FM135IV	**$22.95**

Item	Code	Price
Category 4 Jack, Double, Straight, Black		
T568A	FM137	**$14.95**
T568B	FM136	**$14.95**
Fiber Jack, Double, Straight		
SC	FM138	**$49.95**
ST	FM139	**$24.95**
8-Position Jack, Ethernet, Straight, Double		
Black	FM140BL	**$15.95**
White	FM140WH	**$15.95**
Gray	FM140GR	**$15.95**
Ivory	FM140IV	**$15.95**
8-Position Jack, Token Ring, Straight, Double		
Black	FM141BL	**$11.95**
White	FM141WH	**$11.95**
Gray	FM141GR	**$11.95**
Ivory	FM141IV	**$11.95**

Item	Code	Price
Blank Coupler		
Black	FM142BL	**$1.95**
White	FM142WH	**$1.95**
Gray	FM142GR	**$1.95**
Ivory	FM142IV	**$1.95**
Cut-Out for Data Connnector		
Black	FM143BL	**$1.95**
White	FM143WH	**$1.95**
Gray	FM143GR	**$1.95**
Ivory	FM143IV	**$1.95**
Color Icons (25/Package)		
Red	FM144RE	**$3.95**
Yellow	FM144YE	**$3.95**
Blue	FM144BL	**$3.95**
Green	FM144GR	**$3.95**
Orange	FM144OR	**$3.95**

Surface-Mount Boxes

Mount Your Couplers and Faceplates on the Wall or Floor.

- **Accept BLACK BOX® Faceplates (see facing page).**
- **Available in white, gray, and ivory to match Faceplates.**

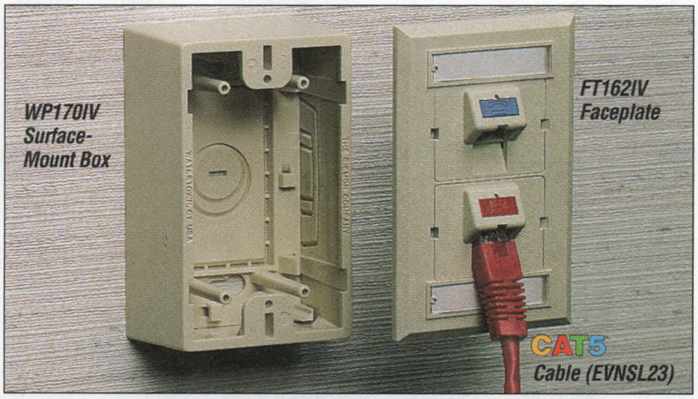
Workstation outlet can't be recessed? You need our Surface-Mount Boxes. Just snap in your Faceplates (see **facing page**) with Couplers and you can mount them on the wall or on the floor.

FAXBACK INFO
Request Document Number: 14797
Call 412-746-5500
Anytime

Item	Code	Price
Surface-Mount Boxes		
Single-Gang		
White	WP170WH	**$6.95**
Gray	WP170GR	**$6.95**
Ivory	WP170IV	**$6.95**
Double-Gang		
White	WP171WH	**$12.95**
Gray	WP171GR	**$12.95**
Ivory	WP171IV	**$12.95**

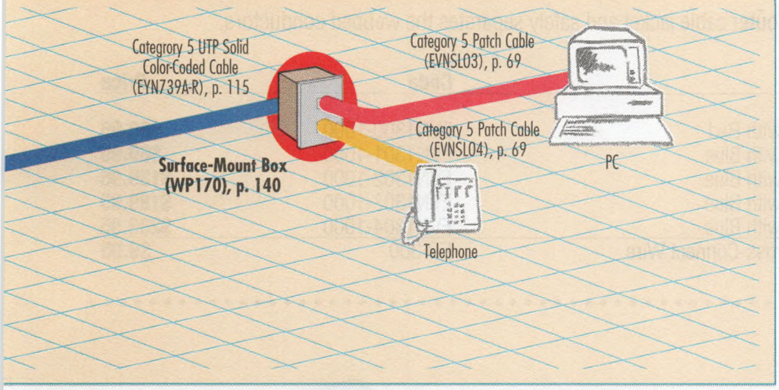
remember to order cables
Category 5 Patch Cable (Beige)
10-ft. (3.0-m)
EVMSL05-0010
$10.95

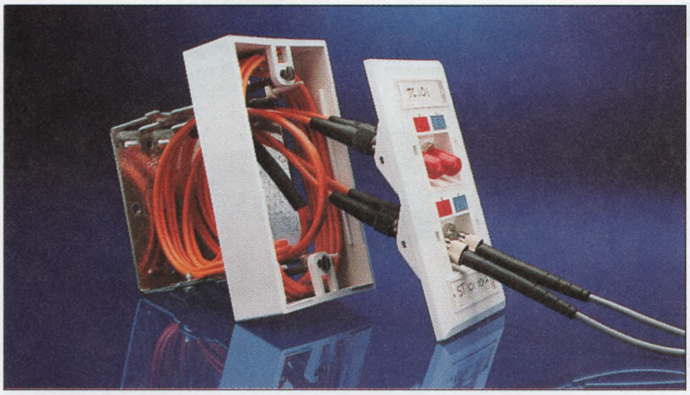
For other lengths and colors, see p. 69.



that Are Neat, Flexible, Reliable—and Easy.

Faceplates, and Surface-Mount Boxes offer options for mounting your Couplers in the workstation. And our Patch Panels and Oversized Patch Panels manage your cabling in the wiring closet. Other features like reversible color-coded icons, designation strips, and labels provide the finishing touches to an efficient, organized cabling system.


Category 5 UTP Solid Color-Coded Cable (EYN739A-R), p. 115
Category 5 Patch Cable (EVNSL03), p. 69
Category 5 Patch Cable (EVNSL04), p. 69
Surface-Mount Box (WP170), p. 140
PC
Telephone



Faceplates and Standoff Rings

Mount Your Couplers on the Wall or to a Surface-Mount Box.

- **Hold up to four Couplers.**
- **Choose from white, gray, and ivory.**
- **Enable quick and easy changes.**

FAXBACK INFO
Request Document Number: 14807
Call 412-746-5500
Anytime

Mount up to four BLACK BOX® Couplers to one of our Faceplates—and then mount the Faceplate on the wall or to a surface-mount box. You get write-on labels (included), so you know exactly where your cabling is going. You can choose either durable plastic or stainless steel (our 2-, 4-outlet models).

Use Standoff Rings for installations requiring extra space behind the faceplate. The extra inch they provide ensures that your fiber cabling maintains the proper bend radius. Faceplates and Standoff Rings come in three colors so you can match them with other accessories.

Labels to designate ports, extensions, etc. are also available in 8½" x 11" sheets to accommodate moves, additions, and changes.

Item			Code	Price
Single Gang	Plastic Faceplates	White	FT162WH	$3.95
		Gray	FT162GR	$3.95
		Ivory	FT162IV	$3.95
	Standoff Rings	White	FT163WH	$5.95
		Gray	FT163GR	$5.95
		Ivory	FT163IV	$5.95
	Stainless Faceplate		FT173	$5.95
Double Gang	Plastic Faceplates	White	FT172WH	$6.95
		Gray	FT172GR	$6.95
		Ivory	FT172IV	$6.95
	Standoff Rings	White	FT164WH	$5.95
		Gray	FT164GR	$5.95
		Ivory	FT164IV	$5.95
	Stainless Faceplate		FT174	$10.95
Reusable Cable Wraps, 6-inch (Pack of 10)			FT265	$12.95

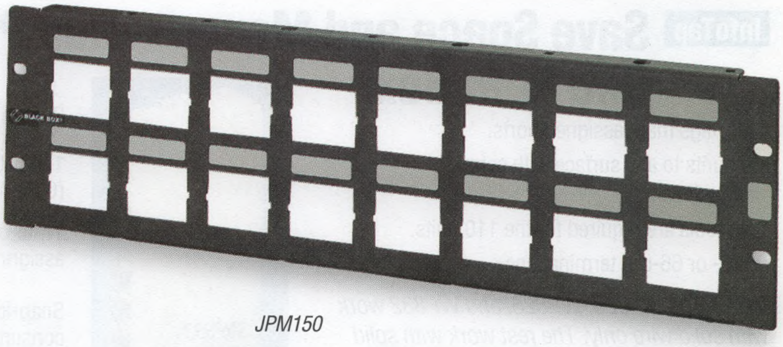
Patch Panels

Organize Your Wiring Closet. Plug Your Cables and Couplers into a Patch Panel.

- **Configured with 24, 32, or 64 ports.**
- **Accept all BLACK BOX® Couplers.**
- **Available in oversized models with extra labeling space.**

These Patch Panels are designed to keep your cabling organized. With 24, 32, or 64 ports, the Panels accept any Coupler (see **facing page**). If you need to remove a Coupler, just pop it out with a screwdriver. Cable tie eyelets on the Coupler provide management and strain relief. If you need more labeling space, order our oversized panels. You can also order extra designation labels and clear plastic holders with designation strips.

FAXBACK INFO
Request Document Number: 14814
Call 412-746-5500
Anytime


JPM150

Item		Code	Price
Patch Panels	32-Port	JPM148A	$39.95
	64-Port	JPM149A	$54.95
Oversized Patch Panels	24-Port	JPM150	$34.95
	64-Port	JPM151	$84.95
Plastic Holders with Paper Strips (6)		FM160	$29.95
Designation Labels (100)		FM161	$29.95

CAT5 Cross-Connect Wire and Cable Prep Tool

EVN1300

Cable Prep Tool (FT1300) sold separately.

FAXBACK INFORMATION
Request Document Number: 14405
Call 412-746-5500 Anytime

The Twisted-Pair Cable that Stays Twisted—Even During Installation.

- **Unique "webbed" insulation maintains consistent conductor spacing and integrity.**
- **Exceeds EIA/TIA TSB-36 Category 5 specifications.**

MORE! CAT5 Solutions, see pp. 68–69, 114–115.

Our CAT5 Cross-Connect Wire features a "webbed" insulation that binds conductors of the twisted-pair together to maintain consistent conductor spacing and pair twists that will not loosen during installation.

Our Prep Tool strips the outer cable jacket and safely separates the webbed conductors.

Item		Code	Price
CAT5 Cross-Connect Wire			
1-Pair	White with Red	EVN1300-1000	**$69.95**
	White with Blue	EVN1301-1000	**$69.95**
2-Pair	White with Blue	EVN1302-1000	**$139.95**
3-Pair	White with Blue	EVN1303-1000	**$189.95**
4-Pair	White with Blue	EVN1304-1000	**$239.95**
CAT5 Cable Prep Tool for Cross-Connect Wire		FT1300	**$9.95**

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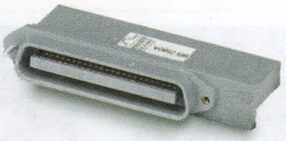
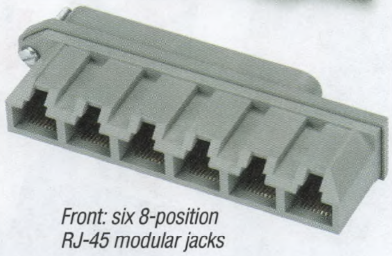
50-Pin Adapter

One Adapter Turns a 50-Pin Connector into Multiple Jacks.



Rear: 50-pin connector



Front: six 8-position RJ-45 modular jacks

- Use in wiring closets to split 25-pair backbone cables into 4-pair horizontal segments.
- Turn your 50-pin ribbon cable into six 8-position RJ-45 modular jacks.
- Compact size is ideal for high-density applications.
- Excellent for voice and data applications.
- Printed circuit board technology provides reliable transmission performance.

Item			Code	Price
50-Pin Adapter	(6) RJ-45 Jack 568B	Male Telco	FM052	**$29.95**

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InfoTap

Save Space and Money—Run Phone and Data Wiring into One Neat Box.

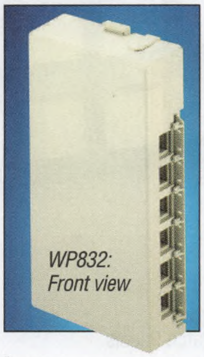
- I.D. tags mark assigned ports.
- Mounts to any surface with screws and adhesive.
- No tools are required for the 110 units.
- 110- or 66-clip terminations.

NOTE: The WP820, WP826, and WP832 work with solid wire only. The rest work with solid or stranded wire.

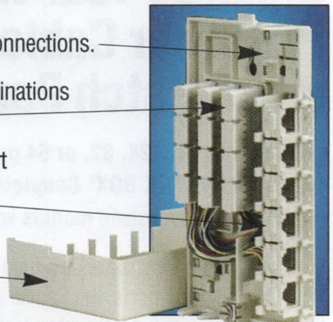
SPECIFICATIONS

Connectors — WP800: (6) RJ-11 4-wire;
WP809: (4) RJ-11 6-wire;
WP815: (3) RJ-45;
WP820: (2) RJ-11 6-wire and (2) RJ-45;
WP826: (4) RJ-45;
WP832: (6) RJ-45

Size — 6.3"H x 4.8"W x 1.8"D (16 x 12.2 x 4.6 cm)



WP832: Front view



Built-in strain-relief ensures undisturbed connections.

110 IDC Connector Block for up to 48 terminations (6 RJ-45s) on solid wire.

Write-on tags snap in to clearly identify port assignments.

Snap-lock cover eliminates time-consuming mounting screws, protects from dirt and moisture.

WP832: Open

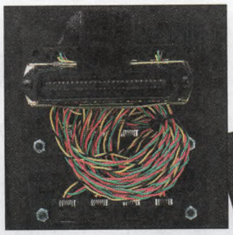
Item		Code	Price
InfoTap®	6x4C Jacks 66 Clip	WP800	**$25.95**
	4x6C Jacks 66 Clip	WP809	**$24.95**
	3x8C Jacks 66 Clip	WP815	**$22.95**
	2x(6C + 8C) Jacks 110	WP820	**$37.95**
	4x8C Jacks 110 WECO	WP826	**$39.95**
	6x8C Jacks 110 WECO	WP832	**$54.95**

RJ Modular Patch Panels Category 3

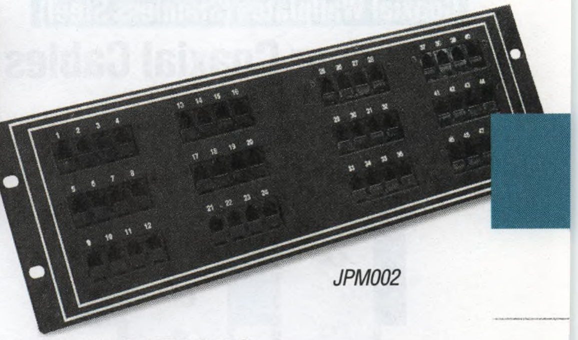
Consolidate Your 50-Pin Telco Leads.

Consolidate your cables. Use this Patch Panel between mainframes, terminals, printers, modems, and other devices. For RS-232 applications.

Item		Code	Price
RJ Modular Patch Panels			
48-Port	4-Wire with 4 Telco Connectors	JPM002	**$260.00**
	6-Wire with 6 Telco Connectors	JPM003	**$280.00**
	8-Wire with 8 Telco Connectors	JPM004	**$310.00**
32-Port	4-Wire with 3 Telco Connectors	JPM022	**$184.00**
	6-Wire with 4 Telco Connectors	JPM023	**$225.00**
	8-Wire with 8 Telco Connectors	JPM024	**$260.00**
24-Port	4-Wire with 2 Telco Connectors	JPM012	**$153.00**
	6-Wire with 3 Telco Connectors	JPM013	**$174.00**
	8-Wire with 4 Telco Connectors	JPM014	**$194.00**
Hinged Mounting Bracket (for 48-Port Panel)		JPM005	**$60.00**



Back of Unit— 50-Pin Telco Male



JPM002

SPECIFICATIONS

Connectors — 4-, 6-, or 8-wire modular jacks; 50-pin telco male

Size — 48-Port: 5"H x 19"W x 3"D (12.7 x 48.3 x 7.6 cm); 32- and 24-Port: 3.5"H x 19"W x 3"D (8.9 x 48.3 x 7.6 cm)

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10BASE-T Panels Category 3

Consolidate up to 24 Lines into Multiple 50-Pin Telco Lines.

Front: 10BASE-T RJ Modular Patch Panel; Back: Left, 10BASE-T Cluster Panel; Right, 10BASE-T Harmonica

10BASE-T RJ Modular Patch Panel

To reassign ports, simply move the RJ jack from one port to another.

10BASE-T Cluster Panel and Harmonica

Use these units as remote extensions of the 10BASE-T RJ Modular Patch Panel.

Connect your 50-pin male telco cable to the rear of the unit and it automatically breaks out the 50 pins into RJ jumper ports on the front.

Item	Code	Price
10BASE-T Panel 24-Port	JPM016	**$144.00**
10BASE-T Cluster Panel, RJ-45 with (12) 4-Wire Ports	FM040	**$59.00**
10BASE-T Harmonica, RJ-45 with (12) 4-Wire Ports	FM035	**$34.00**
Twisted-Pair Ethernet Splice Block with (12) RJ-45 Connectors	JP812	**$88.00**

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Cluster Panel and Bar Category 3

Redistribute Your 50-Pin Telco Lines.

The Cluster Panel and Bar work as a remote extension of our RJ Modular Patch Panel. Or you can use them for distribution of lines in open office situations.

Either unit will adapt a 50-pin telco connector to modular RJ jacks.

Automatically breaks out the 50 pins into RJ jumper ports on the front panel when you connect your 50-pin telco cable to the unit.

RJ-11 Cluster Panel with (12) 4-Wire Ports

RJ-11 Cluster Bar with (12) 4-Wire Ports

SPECIFICATIONS

Connectors — FM001, FM030: (12) RJ-11, 4-wire; (1) 50-pin telco F; FM002, FM031: (8) RJ-11, 6-wire; (1) 50-pin telco F; FM003: (12) RJ-45, 8-wire; (2) 50-pin telco (F); FM032: (6) RJ-45, 8-wire; (2) 50-pin telco F

Size — Cluster Panel: 6.3"H x 4.3"W x 2.1"D (16 x 10.9 x 5.3 cm); Cluster Bar: 1"H x 7.8"W x 1"D (2.5 x 19.8 x 2.5 cm)

Item			Code	Price
Cluster Panel	RJ-11	(12) 4-Wire Ports	FM001	**$70.00**
		(8) 6-Wire Ports	FM002	**$52.00**
	RJ-45	(12) 8-Wire Ports	FM003	**$91.00**
Cluster Bar	RJ-11	(12) 4-Wire Ports	FM030	**$33.00**
		(8) 6-Wire Ports	FM031	**$34.00**
	RJ-45	(6) 8-Wire Ports	FM032	**$35.60**

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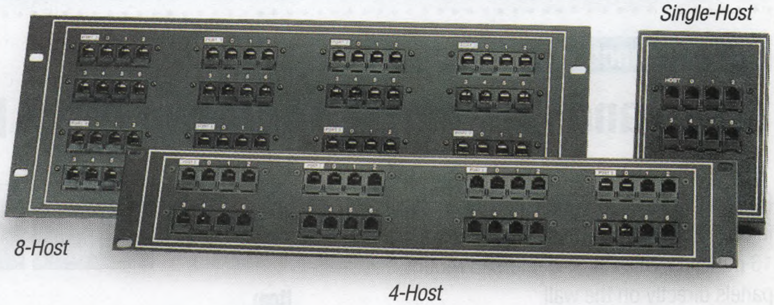
Star Panel Category 3

Connect Baluns in a Star Configuration.



This passive device features eight RJ-11 connectors: one host and seven terminals. Two center pins are bridged on all eight connectors.

You can connect your RJ-11 host cable to the Star Panel in your wiring closet. Then run seven RJ-11 cables out the other end to the Interconnect or RJ Modular Patch Panel (**above**). From there you can go 700 feet (213 m), the aggregate maximum distance, with twisted-pair wire to seven terminals.

Each Star Panel host port is dedicated to one S/3X or AS/400® port.

Item		Code	Price
Star Panel	Single-Host	JP750	**$110.00**
	4-Host	JP751	**$193.00**
	8-Host	JP752	**$305.00**

Coaxial Wallplates (Stainless Steel)

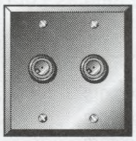
Plug Your Coaxial Cables into These Durable Stainless Steel Wallplates.

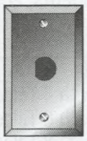
A BNC solder-type jack is included with all but WP211 and WP231.

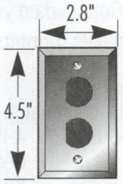
WP210
$5.95

WP230
$7.95

WP200
$6.95


WP220
$9.95


WP211
$2.95



WP231
$3.95

NOTE: Coax plates come standard with 9/16" cutouts for crimp or feedthrough connectors. Specify if 7/16" cutout is required for solder.

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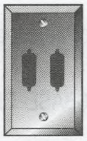
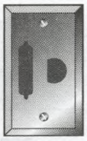
Series D Wallplates (DB9, DB15, DB25, DB37, DB50)

Wallplates for Your D-Sub Connections.

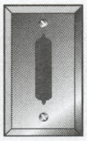
DB9 (WP070)


DB15 (WP081)

DB25 (WP020)


DB25 & Coax (WP050)

DB37 (WP090)


DB50 (WP160)

- Sturdy stainless-steel construction.

Item			Code	Price
DB9	Single-Width	—1 Punch	WP070	**$2.95**
		—2 Punch	WP071	**$3.95**
	Double-Width	—1 Punch	WP072	**$4.95**
		—2 Punch	WP073	**$5.95**
DB15	Single-Width	—1 Punch	WP080	**$2.95**
		—2 Punch	WP081	**$3.95**
	Double-Width	—1 Punch	WP082	**$4.95**
		—2 Punch	WP083	**$5.95**
DB25	Single-Width	—1 Punch	WP020	**$2.95**
		—2 Punch	WP040	**$3.95**
	Double-Width	—1 Punch	WP010	**$4.95**
		—2 Punch	WP030	**$5.95**

Item			Code	Price
DB25 and Coax				
	Single-Width	—1 Punch	WP050	**$3.95**
	Double-Width	—1 Punch	WP060	**$5.95**
DB37	Single-Width	—1 Punch	WP090	**$2.95**
		—2 Punch	WP091	**$3.95**
	Double-Width	—1 Punch	WP092	**$4.95**
		—2 Punch	WP093	**$5.95**
DB50	Single-Width	—1 Punch	WP160	**$2.95**
		—2 Punch	WP161	**$3.95**
	Double-Width	—1 Punch	WP162	**$4.95**

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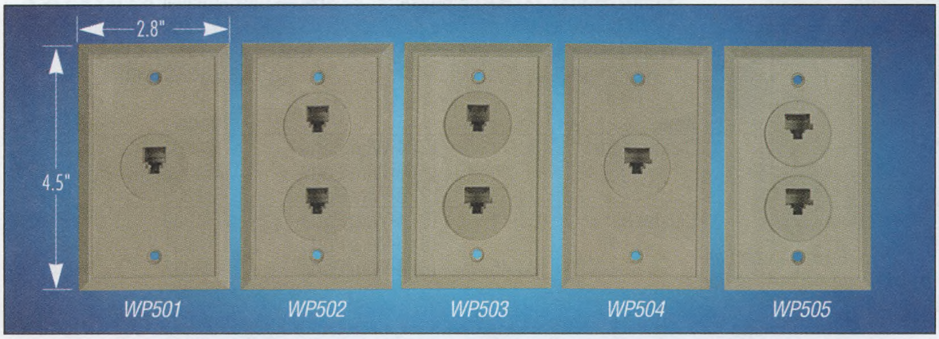
Modular Wallplates (Plastic)

Plug In Your RJ-11 and RJ-45 Cables.



Item			Code	Price
Modular Wallplates (Plastic)				
RJ-11				
	One Jack	4- or 6-Wire	WP501	**$3.95**
	Two Jacks	Both 4- or 6-Wire	WP502	**$4.95**
RJ-11/RJ-45				
	Two Jacks	(1) 4- or 6-Wire, (1) 8-Wire	WP503	**$10.95**
RJ-45				
	One Jack	8-Wire	WP504	**$4.95**
	Two Jacks	Both 8-Wire	WP505	**$10.95**
MMJ/RJ-11			WP508	**$10.95**
MMJ			WP509	**$6.95**

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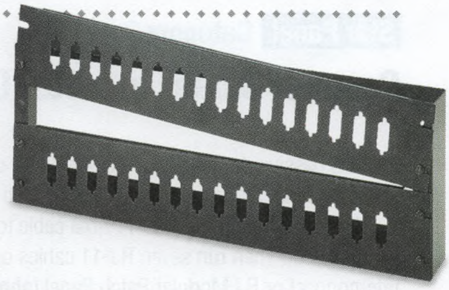
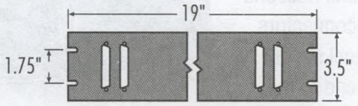
Modular Junction Panels—DB15

Make and Customize Your Own DB15 Rack Panel.



Customize your rack panel for *your* DB15 Ethernet applications—and keep your cables in one central place. These panels come with 16 punches. Use Ring Adapters to mount panels directly on the wall.



SPECIFICATIONS

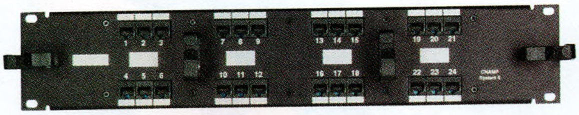
Material — 18-gauge steel
Punches — 16
Size — 3.5"H x 19"W (8.9 x 48.3 cm)

Item	Code	Price
Modular Junction Panels		
DB9	JP011	**$30.70**
DB15	JP111	**$29.95**
DB25	JP221	**$30.70**
DB37	JP281	**$30.70**

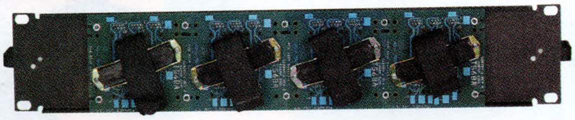
Item	Code	Price
Ring Adapters (for All Wallmount Junction Panels)		
1 Row, 3.5-in. (8.9-cm) high	JP500	**$34.95**
2 Rows, 7.0-in. (17.8-cm) high	JP525	**$46.95**

The CAT5™ 25-Pair Solution for Zone-Distribution Cabling in Open Offices!

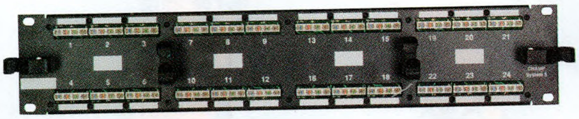
25-Pair Patch Panels



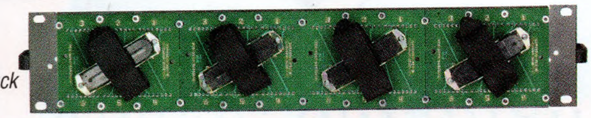
25-Pair Patch Panel (JPM091A), Front



25-Pair Patch Panel (JPM091A), Back



25-Pair Patch Panel (JPM092A), Front



25-Pair Patch Panel (JPM092A), Back

25-Pair Patch Panels

These Patch Panels offer a CAT5 25-pair System interface on the rear of the panel for an easy plug-in connection to the horizontal distribution cabling. Choose from two styles of Panels: T568 wiring (modular) or 110-style. Each 24-port, 3.5" (8.8-cm) Panel supports four 25-pair cables. They're tested, too, to ensure that they meet or exceed Category 5 specifications. And each Panel includes cable-management rings.

T568-Wired (Modular) 25-Pair Patch Panels

These 568B or 568A Patch Panels offer a standard 4-pair modular jack interface on the front of the panel. Use these to connect to equipment panels or hubs via RJ-45 modular patch cables.

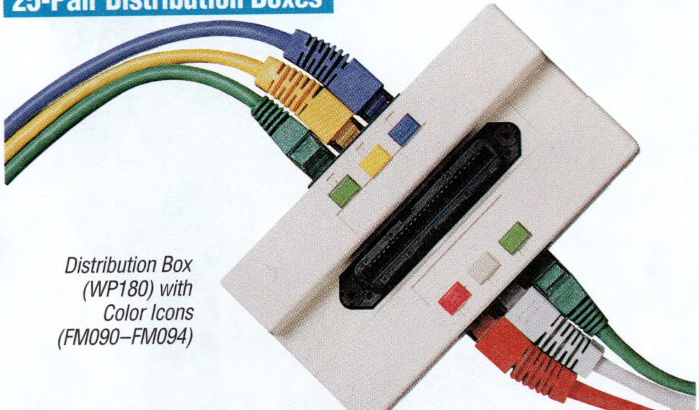
110-Style 25-Pair Patch Panel

This Patch Panel offers a 110-style punchdown interface on the front for single-pair access to cabling. You get even more flexibility than with modular jack patch panels, which can only access the 25-pair cable in 4-pair groups.

Item	Code	Price
25-Pair Patch Panels		
T568B Wiring	JPM090A	**$159.95**
T568A Wiring	JPM091A	**$159.95**
110-Style Interface	JPM092A	**$144.95**
You may also need:		
Type 110 Punchdown Tool	FT362	**$99.50**
remember to order **cables** Category 5 Patch Cable, 10-ft. (3.0-m) (Beige)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

25-Pair Distribution Boxes



Distribution Box (WP180) with Color Icons (FM090–FM094)

25-Pair Distribution Boxes

Use these 25-Pair Distribution Boxes for breaking out the workstation end of a 25-pair cable into six individual 4-pair cables. Locate your Distribution Box in the center of the workstation zone being served by one 25-pair cable. Choose from two style Boxes: T568 wiring or 110-style. Both meet or exceed Category 5 specifications. (Patent pending.)

T568-Wired 25-Pair Distribution Boxes

Use this Box as a multi-user outlet. Locate it in the workstation zone and connect zone-communications equipment directly to the box via RJ-45 station cables. Choose from T568B or T568A models.

110-Style 25-Pair Distribution Box

Use this Distribution Box as a consolidation point in a workstation zone. Punch six 4-pair cables to 110-style blocks in the Box and then feed cable to the individual workstation outlets. Connect zone-communications equipment to the outlets via RJ-45 station cables as with conventional cabling.

PLUS! 25-Pair Plugs, Hoods, & Butterfly Tool, **see p. 124.**

Item	Code	Price
25-Pair Distribution Boxes		
T568B Wiring	WP180	**$28.95**
T568A Wiring	WP185	**$28.95**
110-Style Interface	WP190	**$27.95**
You may also need:		
Type 110 Punchdown Tool	FT362	**$99.50**

Color Icons

Use these Color Icons with your Distribution Boxes for quick identification.

Item		Code	Price
Color Icons, Package of 16	Blue	FM090	**$2.95**
	Green	FM091	**$2.95**
	Red	FM092	**$2.95**
	Yellow	FM093	**$2.95**
	Beige	FM094	**$2.95**

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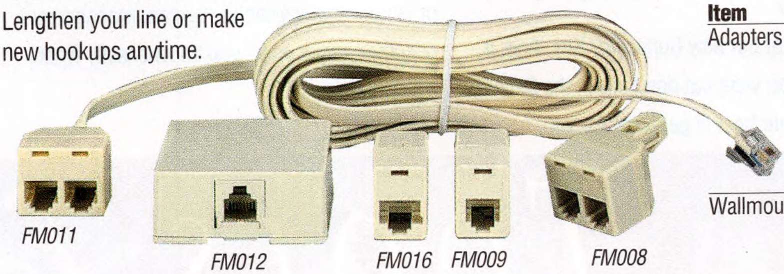
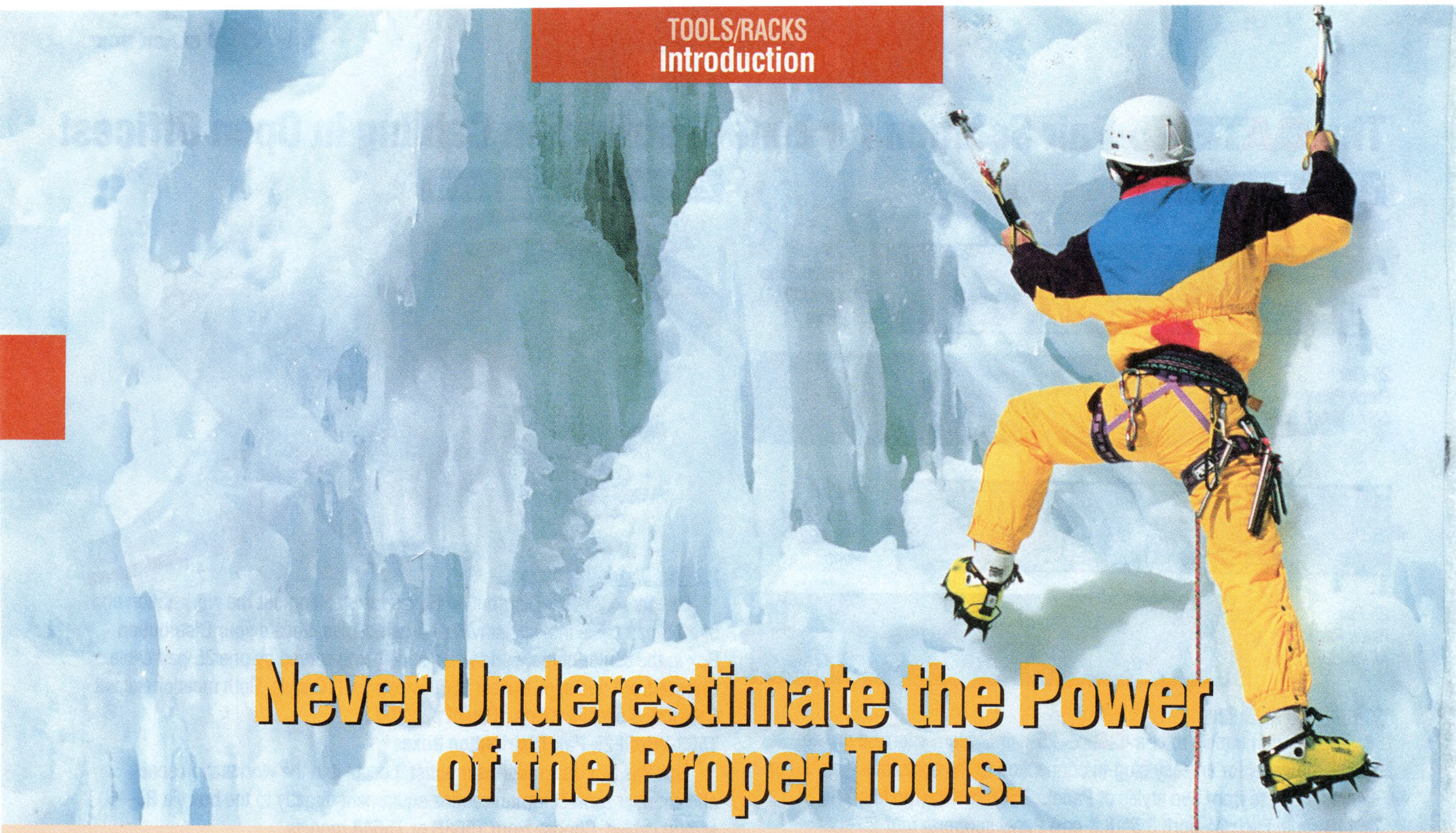
RJ Adapters and Wallmount Blocks

Add a Phone or Modem, Extend a Line, or Mount an RJ Jack.

- Add or move a phone or modem.
- Lengthen your line or make new hookups anytime.



Item		Code	Price
Adapters	4- or 6-Wire T Adapter (Straight-Pinned)	FM008	**$5.95**
	4- or 6-Wire Inline Coupler (Cross-Pinned)	FM009	**$3.95**
	4- or 6-Wire T Adapter (Straight-Pinned) on 15-ft. (4.6-m) Cord	FM011	**$5.95**
	6-Wire Coupler (Straight-Pinned)	FM017	**$3.95**
	8-Wire Coupler (Straight-Pinned)	FM018	**$4.95**
	8-Wire Inline Coupler (Cross-Pinned)	FM016	**$4.95**
Wallmount Blocks	4-Wire	FM012	**$2.95**
	6-Wire	FM013	**$2.95**
	8-Wire	FM014	**$3.95**



Never Underestimate the Power of the Proper Tools.

Tools:

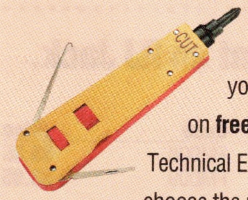
The Right Tool for the Job!

Do-it-yourselfers know that the right tool makes all the difference when doing a job. So they rely on Black Box tools.

Professional's Tool Kit (p.153)

Whether it's stripping cable or taking PCs apart, the job is easier with the right tools. And you can count on Black Box for premium quality. Wrought-iron crimp tools, not lightweight cast steel. Ergonomically designed handles. Complete kits for every topology. And, best of all, most Black Box tools are guaranteed for life.

So become a Black Box do-it-yourselfer. Rely on **free** advice from our Technical Experts to help you choose the proper tool or kit to outfit your toolbox.



Auto Impact Tool (p. 148)

NEW!

The Right Connections—All Boxed Up!

Installations. Repairs. Terminations. Now they're easier than ever with our new Connector Kits.

You asked for them. We listened. The result: two full pages (**pp. 154–155**) of the most popular connectors and plugs all boxed up in convenient kits. You'll save money with the kits. And you'll reap the benefit of having *everything* you need for terminations all in one, organized box. No more fumbling with lots of tiny parts and making sure you have the right tools.

CAT5 *Modular Plug Kit (p. 154)*

Let us know what you think of our new Connector Kits. And, if there are kits you want but don't see in the Catalog, ASK! We'll do our best to get them for you.

Racks:

Cut Clutter. Get Organized!

Why dig through jungles of cables, and climb over mountains of equipment? Transform your wiring closets and computer room with Black Box racking solutions. For fast and easy organization, go for our preassembled NetRack (**p. 167**). Need security? Choose one of our locking Comm Cabinets (**p. 166**). Tie all the loose ends together with our Cable Management tools (**pp. 170–171**). Organize and identify cable runs, relieve cable strain at termination points, or simply conceal cables. System management becomes easier when you know exactly where everything is.

NetRack comes ready to use. No assembly required. (p. 167)

TOOLS &

BLACK BOX
SOLUTIONS

Over 7000 Connectivity Solutions.

"I'm tired of organizing hundreds of tiny parts when I need to do installs and repairs. Do you have anything to make my life easier?"

Deluxe Modular Plug Kit (p.154)

Yes! Our New Connector and Plug Kits are just the ticket. They give you the convenience of a complete kit for different cable topologies—modular, coax, RS-232, RS-449, even Category 5.

These handy Kits feature compartments to keep everything you need organized: the crimp tool, dies, and connectors. No mess. No searching for little parts. And the Kits are small enough to tote along.

Need Extra Parts? No problem. You can order all the parts individually and replenish your kit. You can even order bulk packs and save.

Get It All Tomorrow. If you run out of parts in the middle of a big job, just call Black Box. Order before midnight (ET), and you'll have the right tools in your hands tomorrow.

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BLACK BOX
SOLUTIONS

Getting It Right the First Time!

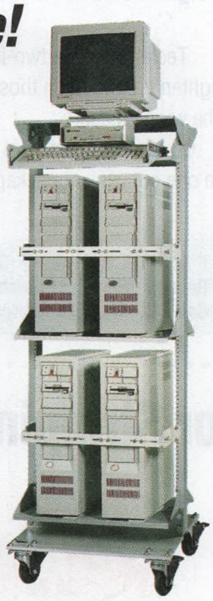
"Help! I'm drowning in a sea of CPUs. They're all over my computer room—on the table, under the table, piled on one another."

Don't Stack 'em...Rack 'em.

Here's the perfect solution—ServRack. Instead of stacking your multiple CPUs in a dangerous and space-eating arrangement, rack 'em.

The exclusive ServRack has all the features you want in a rack: keyboard drawers, a standard switch compartment, tie-down brackets, a power strip, and optional casters for easy movement. You get it all. And you can choose from either desktop or tower-style ServRacks depending on your application.

With the ServRack, you clean up clutter and save space. Simply arrange up to four CPUs, one keyboard, and one monitor on one attractive, organized rack. You prevent your equipment from falling over, and the inside boards are protected from dangerous jostling. ServRack—it's the right way to simplify your work area.

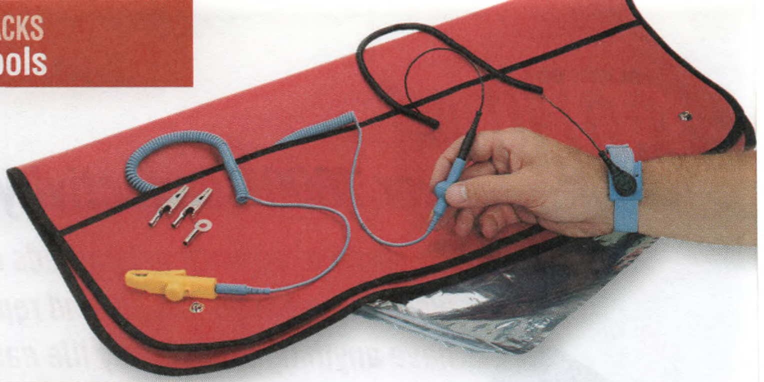


Desktop ServRack (p. 164)

FOR *FAST* TECH SUPPORT,
Call **412-746-5500**

PRESS **1,2,2** CONNECTIVITY
Printer Devices, Cables/Connectors, Switches, **Tools/Racks**, Equipment Protection/Testers

Or if You Prefer:
Fax Us at: 412-746-0746.
E-mail Us at: info@blackbox.com



AntiStatic Service Kit and Wrist Strap

Everything You Need to Prevent Static Blowouts.

- **Protects sensitive circuitry from ESD (Electrostatic Discharge).**
- **Two-layer construction.**

The long-lasting mat features a resilient outer layer. A buried conductive inner layer shields against static charges on floors and work surfaces. You can also wrap sensitive parts in it for return to the service center.

The crocheted cloth Strap is fully adjustable. Strap construction places five silver-plated conductive monofilaments on top of a non-conductive inner surface for greater skin contact.

What's in the AntiStatic Kit:

- Red 24" x 24" (61 x 61 cm) mat with two 8" x 12" (20.3 x 30.5 cm) pockets
- 12-ft (3.6-m) ground cord
- 12-ft (3.6-m) coiled cord with banana/alligator plug
- Post strap and 1-Mohm resistor
- Bull clip with snap connector
- Adjustable blue cloth wristband with post snap
- ESD shielding bag

FAXBACK INFORMATION
Request Document Number: 14515
Call 412-746-5500 Anytime

Item	Code	Price
AntiStatic Service Kit	FT200	**$51.95**
AntiStatic Wrist Strap 12-ft (3.6-m) Cord	FT201	**$12.00**

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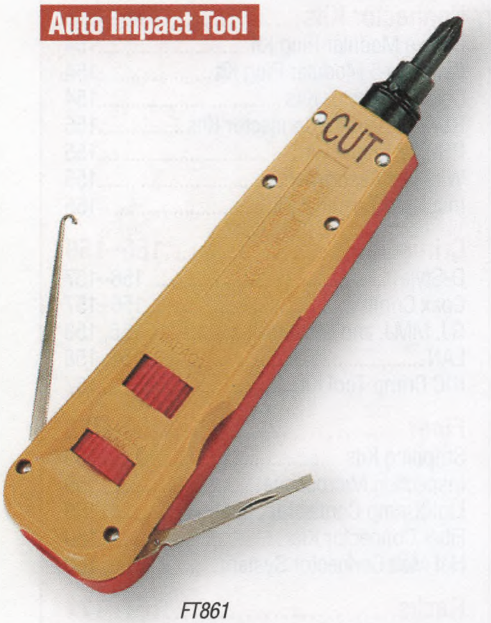
Auto Impact Tool



FT861

This Combination Impact/Torque Tool Makes a Great Addition to Any Tool Kit.

- **Built-in hook and spudger blades fold into the handle frame for convenient storage.**
- **Ideal for use with Krone blocks.**
- **Carry your favorite spare blade—*right inside the handle!***

Techs: Here's a two-in-one tool that'll lighten your load on those service calls to the wiring closet!

Our Auto Impact Tool carries everything in one convenient package.

Use the fold-out hook to trace wires from a bunch or pick one from a block. Use the spudger to remove modules from Krone blocks without cutting them.

There's a spare blade tuck-away in the hollow-handle storage compartment. And there's room enough to hold even a BIX or woodscrew starter blade. Extra blades are listed.

FAXBACK INFORMATION
Request Document Number: 14546
Call 412-746-5500 Anytime

Item	Code	Price
Auto Impact Tool with Screwdriver Blade	FT860A	**$79.95**
	FT861	**$94.95**
Screwdriver Blade	FT862	**$17.95**
Adapter Blade	FT863	**$19.95**

◆ ◆ ◆

Two Innovative Tools for Stripping Solid and Twisted-Pair Cable.

Hand Stripper

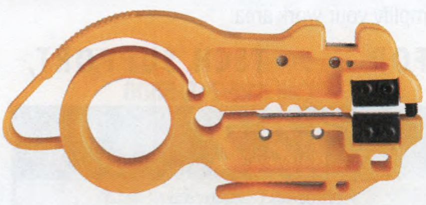
- Nick-free stripping of wire ranging from 8 AWG solid to 22 AWG stranded.
- Crimps conductor portions, non-insulated terminals and splices.
- Cuts five different machine screw sizes.

MORE! Tools, see pp. 149, 152–160.

FAXBACK INFORMATION
For these Stripping Tools: 15554
Call 412-746-5500 Anytime

Item	Code	Price
Hand Stripper	FT230A	**$24.95**
Multi-Strip	FT231A	**$29.95**

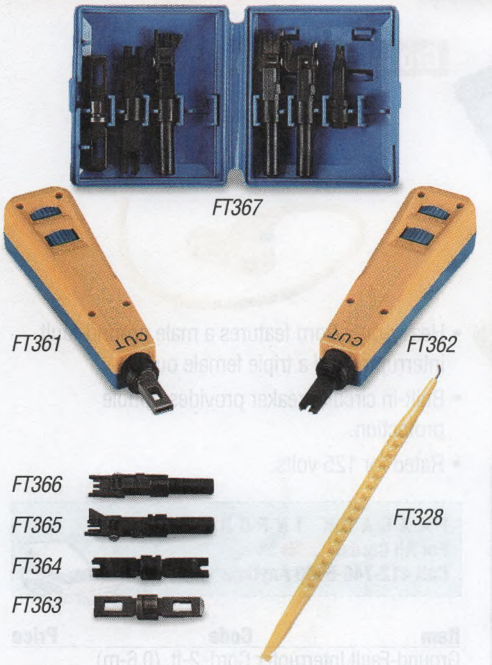
Multi-Strip



- Slits and strips twisted-pair and flat satin cable.
- Removes a wide variety of jacket materials.
- Features a tension loop and adjustment screw to control blade penetration.

Punchdown Block Tool

Efficient Connections, Less Effort.



- **For 110 terminations on jacks or patch panels.**

With our unique Punchdown Block Tool you can make efficient connections with less effort. It has a variety of interchangeable blades and is an essential part of any tool pouch. The durable molded handle has a universal blade mount so you can swap blades quickly and easily. And the handle has space to store extra blades for your convenience.

Order Tool and Blade Kits, or Separate Blades. Most popular handle-blade combinations are available. The Deluxe Blade Kit includes: Type 66, Type 110, BIX, Krone®, ADC, QCP, and 3M System D-type blades, combined in one compact kit.

Use the Wire Maintenance Tool (Spudger) to trace wires on a Punchdown Block.

- **Terminates and cuts in one motion.**
- **Components available separately or in kits.**

Item	Code	Price
Punchdown Block Tool		
Tool Only	FT360	**$75.00**
Tool and Type 66 Blades	FT361	**$95.00**
Tool and Type 110 Blades	FT362	**$99.50**
Blades for Punchdown Block Tool		
Type 66	FT363	**$24.00**
Type 110	FT364	**$28.50**
Type Krone	FT365	**$68.50**
Type BIX	FT366	**$68.50**
Deluxe Blade Kit Contains: Type 66, Type 110, Krone, BIX, ADC, QCP, 3M System D	FT367	**$472.00**
Wire Maintenance Tool (Spudger)	FT328	**$1.50**
Package of 10	FT328-10	**$14.50**
Package of 25	FT328-25	**$35.50**

5-Pair Termination Tool

Speedy Cable Installing: This Tool Packs Five Punches in One Push.

- **Makes five, four, or three perfect terminations at a time.**

It's hot in that wiring closet! Now get in and out five times faster than before, with the truly innovative BLACK BOX® 5-Pair Termination Tool.

This five-headed tool is the only termination tool that can perform multipair terminations on both sides of a 110-style connector block.

Just one push gives you five complete twisted-pair terminations on the cable side and the cross-connect side of the block.

With a 5-Pair Termination Tool, you're off the job site in no time at all.

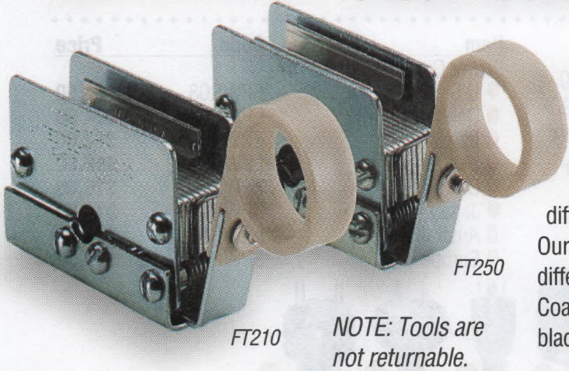
FAXBACK INFORMATION
Request Document Number: 14522
Call 412-746-5500 Anytime

Item	Code	Price
5-Pair Termination Tool	FT950A	**$199.95**
Replacement Head	FT951A	**$51.95**
Replacement Blade	FT952A	**$31.95**

PLUS! For Crimp Tools, see pp. 156–158.

Cable Stripping Tools

Clean Cable Stripping in Just One Step.



NOTE: Tools are not returnable.

- **Expose the braid and the center conductor in one easy step.**

Cable stripping is easy—if you have the right tools.

The Coaxial Stripping Tool adjusts to fit different sizes of coaxial cable including RG62. Our Twinaxial Tool strips insulation from several different types of twinaxial cable. Both the Coaxial and Twinaxial Tools have replaceable blades.

PLUS! Testers, see pp. 196–204.

Our Ethernet Tool is especially suited to stripping braided insulation, and the ThinNet Stripping Tool is for use on RG58 PVC cable.

Item	Code	Price
Cable Stripping Tools		
Coaxial	FT210	**$31.95**
Twinaxial	FT215	**$67.00**
Ethernet (N-Type)	FT250	**$67.00**
ThinNet (PVC)	FT255	**$41.00**

Heavy-Duty Extension Cords for Indoor/Outdoor Use.

Indoor/Outdoor Cords

- Premium-quality 3-wire indoor/outdoor extension cords feature heavy-duty vinyl construction.
- Grounded cords feature three rugged outlets.
- Designed for industrial usage and long life.

EPWR30
EPWR40
EPWR60
EPWR50

INDOOR/OUTDOOR UTILITY CORDS

Length	Model							
	Single Outlet 14/3 Grounded **Orange**, Heavy-Duty		Triple Outlet 14/3 Grounded **Orange**, Heavy-Duty		Triple Outlet 14/3 Grounded Black, Heavy-Duty		Triple Outlet 12/3 Grounded **Blue**, XX Heavy-Duty	
15-ft. (4.5-m)	EPWR30	**$9.95**	EPWR40	**$11.95**	EPWR60	**$12.95**	EPWR50	**$15.95**
25-ft. (7.5-m)	EPWR32	**$12.95**	EPWR42	**$15.95**	EPWR62	**$16.95**	EPWR52	**$21.95**
50-ft. (15-m)	EPWR34	**$21.95**	EPWR44	**$26.95**	EPWR64	**$27.95**	EPWR54	**$36.95**
100-ft. (30-m)	EPWR36	**$39.95**	EPWR46	**$46.95**	EPWR66	**$49.95**	EPWR56	**$69.95**

Ground-Fault Interrupter Cord

- Heavy-duty Cord features a male ground-fault interrupter and a triple female outlet.
- Built-in circuit breaker provides double protection.
- Rated for 125 volts.

FAXBACK INFORMATION
For All Cords: 17264
Call 412-746-5500 Anytime

Item	Code	Price
Ground-Fault Interrupter Cord, 2-ft. (0.6-m)	EPL115	**$44.95**

Throw Some Light on the Problem.

Fluorescent Lights

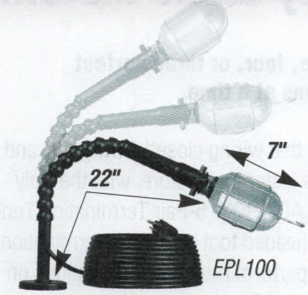
- Ideal for tight areas, this compact work light gives off energy-efficient 13-watt illumination.
- Full-length reflectors provide light output equal to a 60-watt incandescent bulb.
- Multi-position hanger hook rotates 360 degrees.
- Top-quality construction includes a shatter-resistant housing, three-conductor plug-in ballast, and an on/off pushbutton.
- UL® approved.

Item	Code	Price
Fluorescent Utility Light, 25-ft. Cord (7.5-m)	EPL105	**$29.95**
Fluorescent Reel Light, 40-ft. Cord (12-m)	EPL110	**$67.95**

18"
25-ft. Cord
EPL105
40-ft. Cord
EPL110

FAXBACK INFORMATION
For All Lights: 17271
Call 412-746-5500 Anytime

Flexible-Neck Trouble Light



- Direct the light exactly where you want it.
- A powerful magnet holds the Light in place.
- Features a heavy-duty 25-ft. cord, hanger hook, push-through on-off switch, a metal swing-open guard, and a three-wire plug.
- UL® listed.

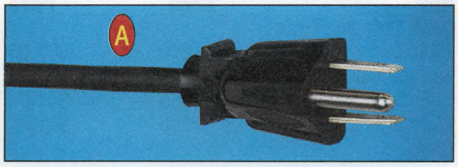
Item	Code	Price
Magnetic Flexible-Neck Trouble Light	EPL100	**$42.95**

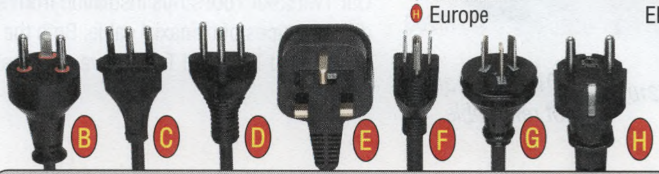
Power Cords

Power Cords for Replacements or Adapting Your Machine to a Different Wall Socket.

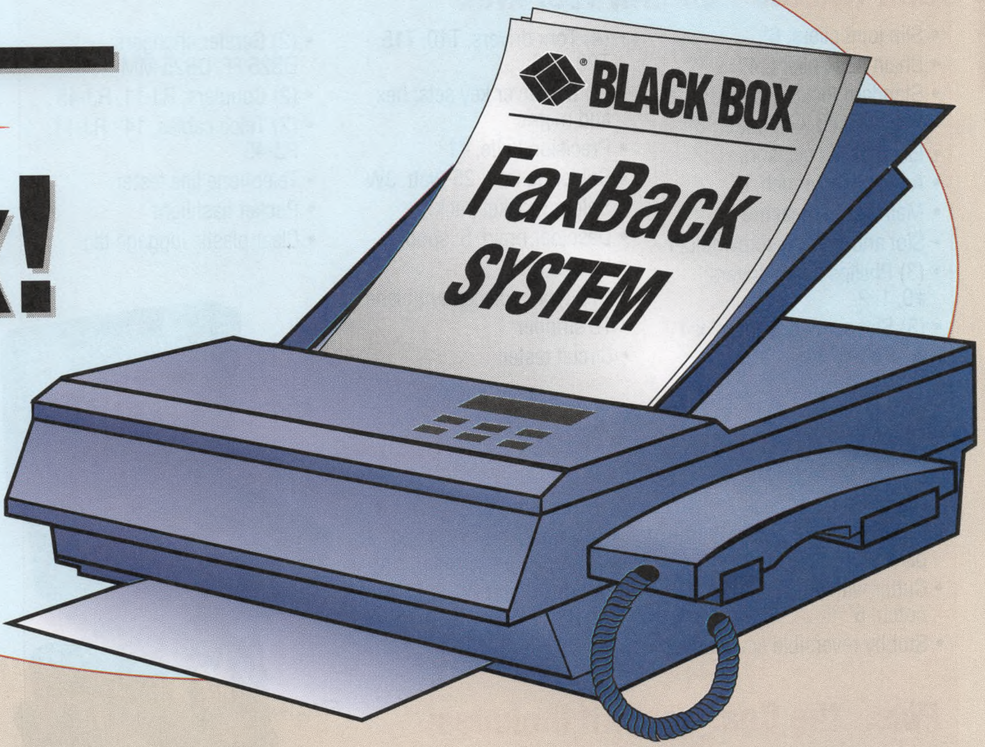
Choose the Cord with the wall-socket plug you need. The other end has a molded IEC 320-style plug. The cable consists of three 18 AWG (1.2-mm) stranded conductors. These Power Cords meet the appropriate countries' safety requirements.

Item	Code	Price
Power Cords, 6.5-ft. (2-m)		
Ⓐ U.S.	EPWR08	**$4.50**
Ⓑ Denmark	EPWR01	**$24.00**
Ⓒ Italy	EPWR02	**$12.00**
Ⓓ Switzerland	EPWR03	**$16.00**
Ⓔ U.K.	EPWR04	**$16.00**
Ⓕ Japan	EPWR05	**$14.00**
Ⓖ Australia	EPWR06	**$12.00**
Ⓗ Europe	EPWR07	**$12.00**





Find Out *More*— by Fax!



Call the BLACK BOX® FaxBack System— 412-746-5500.

Get all the details you need to make the right choices for your computer communication system delivered right to *your* fax machine—automatically—any time, 24 hours a day, 7 days a week.

The BLACK BOX® FaxBack System features more than 550 documents providing in-depth technical information on proven Black Box solutions, today's Hot New Products, and much more!

Last year, the FaxBack System fulfilled 78,000 requests for documents. And our Technical Experts are continuously producing new documents as more new products are added to our Catalog.

For current information at *your* convenience, call Black Box. The *best* information by fax from *The World's Source for Connectivity.*℠

Look for This Symbol!

FAXBACK INFO
Request Document Number: 16414
Call 412-746-5500
Anytime

It shows you which products have FaxBacks and the Document Number to request when you call! Just dial **412-746-5500**, **press 1**, **4** to reach the BLACK BOX® FaxBack System.

MORE! BLACK BOX® FaxBack System details, **see pp. 632–633.**

Tool Kits

Tool Kits for Network Installation and General Computer Repair and Maintenance.

- The network Tool Kits include stripping tools, adapters, and cable for convenient wiring and network installation and repair.
- Choose the Service Tool Kit for general computer repair, maintenance, and troubleshooting. (Adapters and cable not included.)

What's in the Voice/Data, Coax, and Twisted-Pair LAN Tool Kits:

- Slip joint pliers, 6"
- Chain nose pliers, 4"
- Standard locking pliers, 5"
- Long-nosed with cutter, 6"
- Electrician's scissors
- Adjustable wrench, 6"
- Metric tape measure
- Slot and Phillips screwholder
- (3) Phillips screwdrivers: #0, 1, 2
- (3) Slot screwdrivers: ⅛" x 4", 3/32" x 2", 5/16" x 6"
- (4) Torx drivers, T10, T15, T20, T25
- (2) Balldriver key sets: hex and metric
- Precision knife, #1
- Soldering iron, 25-watt, 3W
- Solder (pocket pack)
- Desolder braid, 5' spool
- Impact tool
- 110-type replacement blade
- T6 stripper
- Circuit tester
- (2) Gender changers: DB25 FF, DB25 MM
- (2) Couplers: RJ-11, RJ-45
- (2) Telco cables, 14': RJ-11, RJ-45
- Telephone line tester
- Pocket flashlight
- Clear plastic luggage tag

Plus...the Voice/Data Tool Kit Includes:

- Classic shell, 8" case
- Removable top and bottom pallets
- Cutter with strip notch, 5"
- Stubby reversible screwdriver
- Wire cutter
- (4) Nutdrivers: 3/16", ¼", 5/16", ⅜"
- (3) Adapters: DB9F to DB25F, modular, and RS-232 to RJ-12/45

Plus...the Coax Tool Kit Includes:

- Softside cordura case
- Phillips screwdriver, #0
- Coax cable cutter
- (2) Test cables, 60': RG58, RG59
- RG58/59/62AU stripper

Plus...the Twisted-Pair LAN Tool Kit Includes:

- Softside cordura case
- Diagonal cutter, 4"
- Universal cable, 4"

FT103A

FT102A

FT101A

What's in the Service Tool Kit:

- Metal rule, 6"
- 6-Piece short arm
- Chain nose pliers, 4"
- Diagonal cutter, 4"
- Electrician's scissors
- Solder pack
- Soldering iron
- Desolder braid, 5' spool
- Adjustable wrench, 4"
- Precision knife, #1
- Junior handle
- (2) Screwdriver blades: ¼", 3/16"
- (3) Phillips blades: #0, #1, #2
- Phillips screwdriver, #0
- Slot screwdriver, 3/32" x 2"
- Adjustable wire stripper
- Alignment tool, non-metallic
- Telephone line tester
- Zipper case
- LCD display pen

FT100A

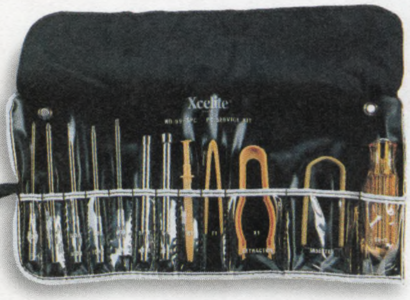
FAXBACK INFORMATION
Request Document Number: 14498
Call 412-746-5500 Anytime

Item	Code	Price
Tool Kits		
Service	FT100A	**$249.95**
Voice/Data	FT103A	**$795.95**
Coax	FT102A	**$649.95**
Twisted-Pair LAN	FT101A	**$659.95**
Empty Cases		
Softsided for Service Kit	FT104A	**$49.95**
Softsided for Twisted-Pair LAN and Coax Kits	FT105A	**$139.95**
Hard Shell for Voice/Data (8")	FT106A	**$199.95**

◆

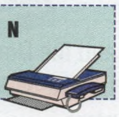
Roll-Up Tool Kit

This PC Tool Kit Features a Handle with Change-Out Blades.



- The tools you'll find most useful.
- Highest quality.

FAXBACK INFORMATION
Request Document Number: 14508
Call 412-746-5500 Anytime



Item	Code	Price
Roll-Up Tool Kit	FT202	**$45.00**

What's in the Roll-Up Tool Kit:

- Regular replaceable blade handle, 4"
- Slot blade, 4"
- (2) Torx drivers; #10, #15
- (2) Nutdriver blades: 3/16", ¼"
- (2) X-points: #0, #1
- Parts picker
- Tweezers
- IC inserter and extraction tool
- Roll-up pouch

Tool Kits Designed Specifically for the Professional, Technician, and PC User—All from Black Box.

PC Tool Kit

The Tool Kit for Do-It-Yourself Maintenance.

To service personal computers, support technicians and PC owners rely on this handy tool kit.

What's in the PC Tool Kit:

- (2) Nutdrivers (3⁄16", 1⁄4")
- 3-Prong parts extractor
- Insulated assembly tweezers
- Torx driver (for Compaq® computers)
- Spare parts tube
- Screwdriver, Philips #1 (overall, 6")
- Screwdriver, Phillips #0 (overall, 5½")
- Screwdriver, slotted (overall, 6")
- Screwdriver, slotted (overall, 5½")
- Chip extractor (Insulated)
- Vinyl zipper case, 1.5"H x 8.5"W x 6"D (3.8 x 21.6 x 15.2 cm)

Item	Code	Price
PC Tool Kit	FT810	**$29.95**

VIPreview
Ask for our
Tools and Racks VIPreview.

For an Easy Roll-Up PC Tool Kit, Look This Way!

Technician's Tool Kit

The Handy, Compact Version of the Pro's Tool Kit.

Don't pay for more tools than you need. Here's the scaled-down version of our Professional's Tool Kit with all the basic tools.

What's in the Technician's Tool Kit:

- IC inserter
- Chip extractor
- Soldering iron
- Solder
- Lead shears
- 2 Nutdrivers (3⁄16", 1⁄4")
- Reversible Torx screwdriver
- Assembly tweezers
- 3-Prong parts extractor
- Wire cutter/stripper
- Spare-parts tube
- (3) Slotted screwdrivers
- (3) Phillips screwdrivers
- Vinyl zipper case, 1.5"H x 11"W x 7.5"D (3.8 x 27.9 x 19.1 cm)

Item	Code	Price
Technician's Tool Kit	FT812	**$79.95**

FAXBACK INFORMATION
For the Professional's Tool Kit: 14687,
For the Technician's Tool Kit: 14670,
For the PC Tool Kit: 14058,
Call 412-746-5500 Anytime

Professional's Tool Kit

All the Tools the Pros Use for PC Repair.

TECH SUPPORT'S PRODUCT OF CHOICE
BEST

Here's the tool kit you need for tackling any job. It's fully stocked. Our own Tech Support Team approved this selection of tools.

What's in the Professional's Tool Kit:

- Hex Allen set (0.28 to 5⁄32")
- Desoldering tool
- Solder aid/brush
- Soldering iron
- Pocket pack solder
- (2) Spudgers: component and wire
- Disposable flashlight
- Trimpot adjuster
- Self-locking tweezers
- Slot screwstarter
- Phillips screwstarter
- (2) Pocket screwdrivers
- Long-slot screwdriver (1⁄8")
- (2) Driver handles
- (3) Nutdriver blades (3⁄16", 7⁄32", 1⁄4")
- (3) Slotted screwdriver blades (1⁄8", 3⁄16", 1⁄4")
- (3) Phillips screwdriver blades (#0, #1, #2)
- Extension cable (4")
- Combo offset screwdriver
- Precision knife
- Electrician's scissors
- Adjustable wire-stripper
- (2) Diagonal cutting pliers (4" and 6")
- (2) Chain-nosed pliers (4" and 6")
- Slip-joint pliers (6")
- Adjustable wrench (6")
- AC polarity tester
- Magnetic parts extractor
- Cordura carrying case, 3"H x 16"W x 11"D (7.6 x 40.6 x 27.9 cm)

Item	Code	Price
Professional's Tool Kit	FT805	**$355.00**

Absolutely Guaranteed for Life
New

Deluxe Modular Plug Kit

Here's the Complete Kit for Repairing or Installing RJ-Type Modular Plugs.

The Deluxe Modular Plug Kit is designed for anyone who repairs or installs RJ-type modular plugs. The Kit includes a Deluxe Modular Plug Termination Tool that acts as a cable cutter, cable jacket stripper, and smooth ratchet for full connector termination. It has a cushioned grip and spring-actuated handles for maximum operator comfort. You can use the Termination Tool with four-, six-, and eight-position line-cord connector plugs by switching the die included in the Kit.

What's in the Deluxe Modular Plug Kit:

- Deluxe Modular Plug Termination Tool
- (1) 4- to 6-position die set (RJ-11)
- (1) 8-position die set (RJ-45)
- (25) 4-position plugs
- (25) 6-position plugs
- (25) 8-position plugs
- Compact metal box (1.5"H x 11.5"W x 8"D, 4 lb.)

FAXBACK INFORMATION
Request Document Number: 18856
Call 412-746-5500 Anytime

Item	Code	Price
Deluxe Modular Plug Kit	FTM600	**$214.95**

◆ ◆ ◆

CAT5 Modular Plug Kit

All You Need for Category 5 Plug Repairs and Installations.

- **Category 5 die set exceeds EIA/TIA 568A and TSB-40A requirements for 4-pair RJ-45.**
- **Load bar maintains ½" twist prior to termination so it's easy to use.**

When making repairs or installations on your Category 5 8-position modular plugs, make sure you have everything you need at your side. The termination tool cuts and crimps Category 5 modular plug connectors. It also acts as a cable cutter and cable jacket stripper. Its smooth ratchet gives you full connector termination and the cushioned grip and spring-actuated handles make the Tool easy to hold. Use the ratchet release to disengage the ratchet during faulty terminations.

What's in the CAT5 Modular Plug Kit:

- (1) Deluxe modular plug termination tool (See Tool description **above**.)
- (1) Category 5 4-pair UTP die set
- (100) Solid 8-position high-performance Category 5 modular plugs
- Compact metal box (1.5"H x 11.5"W x 8"D, 4 lb.)

FAXBACK INFORMATION
Request Document Number: 18863
Call 412-746-5500 Anytime

New
Absolutely Guaranteed for Life

Item	Code	Price
CAT5 Modular Plug Kit	FTM650	**$214.95**

◆ ◆ ◆

New
SUPER CHAMP BNC 58

RG58- and RG59/62-Type Coax Connector Kits

Handy Connector Kits for RG58 and RG59/62 Connections.

- Manual Crimp Tool included in Kit.
- Two models to choose from.

What's in the RG58 & RG59/62 Kit:

- (1) Manual crimp tool (RG58 or RG59/62)
- RG58: (20) BNC-type connectors (50 Ω)
- RG59/62: (20) BNC-type connectors (75/93 Ω)
- (20) Ferrules
- (20) Contacts
- Metal storage box

FAXBACK INFORMATION
Request Document Number: 18870
Call 412-746-5500 Anytime

Item	Code	Price
Coax Connector Kits		
RG58-Type	FTM700	**$128.95**
RG59/62-Type	FTM750	**$128.95**

Multiposition Repair Kit
Build 9-, 15-, 25-, & 37-Pin Connectors
New

RS-232/RS-449 Connector Kit

Repair and Replace RS-232/RS-499 Sub-Miniature Connectors.

What's in the RS-232/RS-449 Connector Kit:

- (100) Sockets
- (100) Pins
- (12) Receptacles (3 each): 9-, 15-, 25-, and 37-position
- (24) Plugs (6 each): 9-, 15-, 25-, and 37-position
- (24) Cable clamps (6 each): 9-, 15-, 25-, and 37-position
- Service tool
- Insertion/Extraction tool
- Compartmentalized metal box

FAXBACK INFORMATION
Request Document Number: 18887
Call 412-746-5500 Anytime

Item	Code	Price
RS-232/RS-449 Connector Kit	FTM800	**$179.95**

RS-232 Repair Kit

Everything for RS-232 25-Pin Hood Assemblies.

What's in the RS-232 Repair Kit:

- (12) Hood assemblies and hardware
- (18) Plugs (male) for 25-pin connectors
- (100) Pins
- (100) Sockets
- (6) Receptacles (female) for 25-pin connectors
- Insertion/extraction tool
- Compartmentalized metal box

To help with your repairs, check out our D-Style Pin Crimp Tool on **page 157**.

PLUS! Replacement Connector Smart Paks, **see p. 126.**

FAXBACK INFORMATION
Request Document Number: 18894
Call 412-746-5500 Anytime

Item	Code	Price
RS-232 Repair Kit	FTM850	**$85.95**
D-Style Pin Crimp Tool	FT073	**$115.95**

RS-232 Repair Kit
New
Complete 12 DB25 Hoods

New
Includes 130 Shells!

Wire Nut Assortment

Connect Power Conductors without the Fuss.

- Connect power conductors easily without twisting, soldering, or wrapping with tape.
- Screw action automatically twists wires together for a snug fit.
- Color-coded, high-dielectric, plastic shells make identification easy.

What's in the Wire Nut Assortment:

- (40) Gray 16–22 AWG
- (30) Blue 14–22 AWG
- (25) Orange 14–24 AWG
- (25) Yellow 10–18 AWG
- (25) Red 10–18 AWG

FAXBACK INFORMATION
Request Document Number: 18904
Call 412-746-5500 Anytime

Item	Code	Price
Wire Nut Assortment	FTM900	**$16.95**

Insulated Terminal Kit

Electrical Wiring Jobs Are Easier with Scotchlok® Terminals.

What's in the Insulated Terminal Kit:

- (275) Rings in the following wire gauges/stud sizes (50 each): 18–22 AWG/8; 18–22 AWG/5–6; 14–16 AWG/5–6; 14–16 AWG/8; 14–16 AWG/10; (25 each): 10–12 AWG/10
- Crimp tool
- (200) Fork terminals in the following wire gauges/stud sizes: (50 each) 18–22 AWG/8; 18–22 AWG/6; 14–16 AWG/8; 14–16 AWG/10
- (50) Gap disconnects with 0.11" width and 0.02" gap
- (125) Butt splices in the following gauges (50 each): 18–22 AWG, and 14–16 AWG; (25 each): 10–12 AWG
- Wire marker tape dispenser
- (200) Cable ties (2 sizes)
- Divided metal storage box

650 Terminals in 14 Sizes!

FAXBACK INFORMATION
Request Document Number: 18911
Call 412-746-5500 Anytime

Item	Code	Price
Insulated Terminal Kit	FTM950	**$119.95**

Electrical Terminal Kit
New

An assortment of terminals for 12 to 22 AWG wire sizes.

All the Tools You Need for Accurate LAN, Coax, and Modular Connections.

Get the Convenience of a Complete Kit, or Order Only the Components You Need.

LAN, Coax, and Modular Crimp Tools and Sets

Each kit includes a Blank Crimp Tool Frame. The plastic "spin-around-type" stripping tool features three levels and a notched blade to protect center conductors. All kits also include an Allen wrench for setting spring tension. The Coax Dies, for hex crimping, are numbered by wire size—for example, 0.068, 0.178, 0.324. The Plenum Coax Dies are labeled "Plenum RG58 and RG59."

Universal (Blank Tool) Frame (FT080A)

The right tool for the job—and included in all of our sets listed **below**. Constructed of heavy steel, the Frame features a ratchet-type crimp tool, offset head, adjustable tension, and spring-release lever. The Frame also has an angled head for easy product loading and unloading, limited hand stretch to grasp the movable handle, and molded grips, which minimize user fatigue.

LAN Crimp Tool Kit (FT096A)

Here's everything you need for quick, LAN connections—one crimp tool, one stripping tool, and seven die-sets: (1) D-Style, (3) coax, (3) RJ (RJ-11, 6-wire; RJ-45, telephone handset).

Item	Code	Price
Universal (Blank Tool) Frame	FT080A	**$52.50**
Crimp Tool Kits		
LAN	FT096A	**$335.00**
Universal Coax	FT097A	**$235.00**
RG58/59 Coax	FT098A	**$265.00**
Modular Plug	FT099A	**$289.95**
D-Sub	FT110A	**$225.00**
Dies		
6-Position Modular Plug	FT081	**$35.00**
Long Body	FT082	**$35.00**
8-Position Modular Plug	FT083	**$35.00**
10-Position Modular Plug	FT084	**$35.00**
Spade	FT085	**$35.00**
Coax RG58/59, Hex Pin	FT086	**$35.00**
RG174/8281	FT087	**$35.00**
RG58/59, SQ Pin	FT088	**$35.00**
RG58/59, Plenum	FT089	**$35.00**
RG174-Fiber Optic	FT090	**$35.00**
Fiber Optic and Hex	FT091	**$35.00**
Hi-Density D-Sub	FT093	**$40.00**
D-Sub	FT094	**$40.00**
Power Pole, 20–12 AWG	FT092	**$35.00**
Empty Case	FT095	**$44.95**

$ave when you buy in bulk!

Connector and Crimp Pin Smart Paks (No. of Pieces)		
RJ-11 6-Conductor (50)	FM015-50PAK	**$33.95**
RJ-45 Modular (50)	FM010-50PAK	**$42.95**
RG58 Hex Crimp (25)	FC330	**$66.95**
RG58 Round Crimp (25)	FC331	**$67.95**
RG59 Hex Crimp (25)	FC332	**$67.95**
D-Sub Male Crimp (100)	FA620	**$17.95**
D-Sub Female Sockets (100)	FA621	**$17.95**

Black Box Corporation
D-SUB & HI-DENSITY-D KIT
Black Box Corporation
RG 58 & 59 COAX KIT
ABSOLUTELY GUARANTEED FOR LIFE
FT110A
FT098A

Universal Coax Crimp Tool Kit (FT097A)

Includes one Crimp Tool, one stripping tool, and four coax dies (RG58/59 Hex, RG58/59 SQ, RG58/59, Plenum, RG174/8281).

RG58/R9 Coax Crimp Tool Kit (FT098A)

Includes the Crimp Tool, one stripping tool, two die-sets (RG58/59 Hex and RG58/59 SQ), and two packs of PVC type BNC connectors.

Modular Plug Crimp Tool Kit (FT099A)

Crimp with one piece, thanks to the unique design of these dies. Kit includes Crimp Tool, two die-sets (8- and 10-position Modular Plug), one stripping tool, and one pack each of RJ-11 and R-45 connectors.

D-Sub Crimp Tool Kit (FT110A)

Includes one Crimp Tool, a die-set (D-Sub), and one pack each of male and female pins. NOTE: The die is marked for wire size (18–20, 22–24, etc.), not pin type.

Dies

All the dies you need in one convenient place.

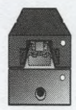
Connector and Crimp Pins (Bulk Packages)

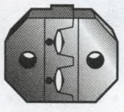
Save by ordering all the connectors and pins you need in convenient bulk packages.

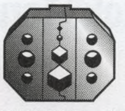
FAXBACK INFORMATION
Request Document Number: 14474
Call 412-746-5500 Anytime

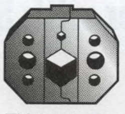
RJ-11 Die
FT081, FT082

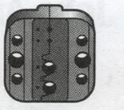
RJ-45 Die
FT083

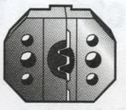

10-Position Die
FT084


Spade Die
FT085


RG58/59 Hex Die
FT086, FT090, FT091


Thick Ethernet
FT087, FT088


RG58/59 Round Die
FT089

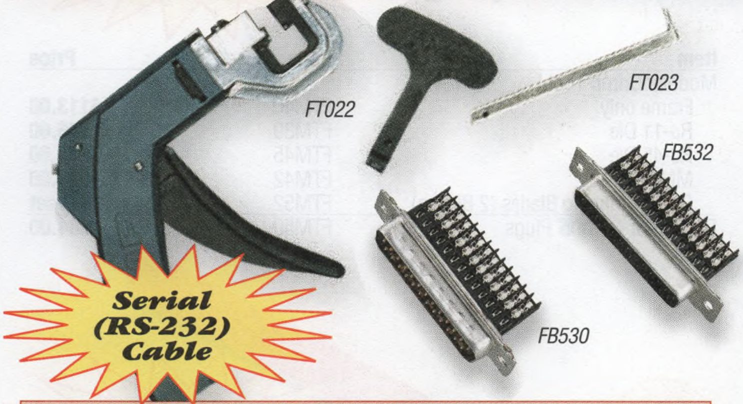

D-Shell Die
FT092, FT093, FT094

> ***"I use Black Box components for a very simple reason—they always work. All the time. The pinouts and cabling are always right, and everything's shipped fast."***

CONVENIENCE
SMART PAK
BUY IN BULK & SAVE!
AVAILABLE!

Insertion Displacement Crimp Tool Kit (IDC)

Terminate RS-232 Cable—in One Easy Step.


FT022
FT023
FB532
FB530
Serial (RS-232) Cable

- Load a Connector (ordered separately) into the Pistol-Grip Crimp Tool.
- Insert cable wire into the hole in the Crimp Tool—and you have a solid connection. No wire-stripping.
- Making single-pin replacements? Kit includes a Hand Termination Tool that's easy to use.
- Bend a pin or damage the connection? Use the Insertion/Removal Tool to pull and replace pins in the Connector.

Item		Code	Price
IDC Complete Tool Kit		FT850	**$335.00**
IDC Hand Termination Tool		FT022	**$7.95**
IDC Insertion/Removal Tool		FT023	**$10.95**
IDC DB25 Connector	Male	FB530	**$3.95**
	Female	FB532	**$3.95**
DB25 Snap-Shut Hood		FB534	**$1.95**

What's in the IDC Kit:

- Pistol-Grip Crimp Tool
- IDC Hand Termination Tool
- IDC Insertion/Removal Tool

D-Style Crimp Tool

This Tool Ensures Accurate D-Style Crimping.

The D-Style Crimp Tool's Locator and Slide hold connector pins securely while you crimp them accurately.

Item	Code	Price
D-Style Pin Crimp Tool	FT073	**$115.95**
Replacement Locator	FT071	**$9.95**
Replacement Slide	FT072	**$7.95**

ABSOLUTELY GUARANTEED FOR LIFE
Serial (RS-232) Cable

Coax Crimp Tools

Coax Connector Crimping—Fast and Secure.

- Easy-Strip 2-Level Tool exposes the shield and the center core. The 3-Level exposes each level—PVC, shield, dielectric, and core.
- Use the Crimping Tools and Die Sets to add the connectors you need.

Item		Code	Price
Easy-Strip Tool	2-Level	FT8200	**$6.95**
	3-Level	FT8300	**$8.95**
Crimping Tools	Coax CR Tool w/H&R Die	FT150	**$130.00**
	Coax Tool Kit, 4 Dies	FT154A	**$220.00**
	Crimp Tool Frame	FT156A	**$52.50**
Die Set, RG58 and RG59			
	Hex	FT185	**$32.00**
	Round	FT190	**$32.00**

ABSOLUTELY GUARANTEED FOR LIFE
RG6 CATV, RG58, RG59, RG62 Cable

Easy-Strip (3-Level) (FT8300)

Coax Tool Kit with 4 Dies (FT154A)

Thicknet Coax Crimp Tool

N-Type Connector Crimping—Fast and Secure.

- Comes with Standard Ethernet die.
- Rated at 50,000 cycles.
- Fine blank steel construction.
- For crimping Standard N-Type Connectors LN110 and LN115 (**page 128**).

Item	Code	Price
Thicknet Coax Crimp Tool	FT152	**$99.95**

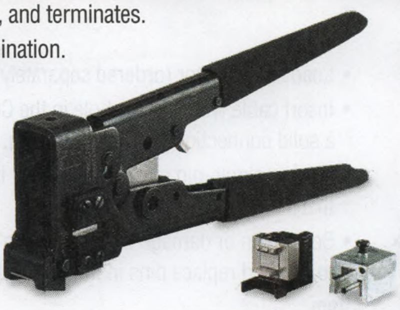
ABSOLUTELY GUARANTEED FOR LIFE
Standard Ethernet Cable
Black Box Corporation
MADE IN U.S.A.

RJ-11, RJ-45, and MMJ Crimp Tool

The Tool for Basic RJ Crimping.

Flat Satin Silver, Solid TP Telco Cable

- This handy crimp tool strips, cuts, and terminates.
- Ratchet control for complete termination.
- Interchangeable die sets for use with many terminations.
- Dies sold separately. Order only what you need.



ABSOLUTELY GUARANTEED FOR LIFE

Item	Code	Price
Modular Crimp Tool		
Frame only	FTM40	**$113.00**
RJ-11 Die	FTM39	**$48.00**
RJ-45 Die	FTM45	**$48.00**
MMJ Die	FTM42	**$64.00**
Spare Stripping Blades (2 Blades)	FTM52	**$9.95 set**
Die Set for CAT5 Plugs	FTM50	**$64.00**

Universal RJ Crimp Tool and Tool Kit

The Most Versatile Tool Kit for All Your Modular RJ Crimping.

- Make your own RJ connections.
- RJ-11, RJ-22, RJ-45, and 10-position dies included in RJ Tool Kit.

What's in the Universal RJ Crimp Tool (FT046A):

- (1) Crimp tool frame
- (1) RJ-45 die set
- (1) RJ-11 6-wire die set
- (1) Storage pouch

What's in the Universal RJ Tool Kit (FT047A):

- (1) Steel frame with built-in cutter and stripper for flat or round cables
- (1) RJ-11 4- or 6-wire die
- (1) RJ-45 8-wire die
- (1) RJ Line 10-wire die
- (1) RJ-22 4-wire die
- Storage container

Includes Round Cable Stripping Mechanism

ABSOLUTELY GUARANTEED FOR LIFE

Flat Satin Silver, Solid TP Telco Cable

RJ-11
6-Position Die
RJ-45
8-Position Die
10-Position
Modular Plug

Item	Code	Price
Universal RJ Crimp Tool	FT046A	**$125.00**
Universal RJ Tool Kit	FT047A	**$225.00**
Replacement Blade Set	FT048	**$15.00**
Replacement Die Sets		
RJ-22 4-Position	FT051	**$30.00**
RJ-11 6-Position	FT052	**$30.00**
RJ-45 8-Position	FT053	**$30.00**
Snagless Standard	FT054	**$30.00**
10-Position Modular Plug	FT055	**$30.00**

LAN Tool Kit 100

Crimping Hardware for *Every* LAN Connector.

Coax, Ethernet, Telco Cable

ABSOLUTELY GUARANTEED FOR LIFE

What's in the LAN Tool Kit 100:

- Coax Crimp Tool
- RJ Crimp Tool—with built-in cable cutter, and cable stripper for twisted-pair and flat cable
- Multi-Purpose Stripping Tool—for twisted-pair and flat cable
- Standard Ethernet Die—Standard N-Type for LN110, LN115 connectors
- RG58/59 Round Die—ThinNet BNC "O" crimp for PVC (FC058); Plenum (FC055); RG59, RG62 BNC (FC090) connectors
- RG58/59 Hex Die—ThinNet BNC Hex crimp for PVC (FC058), Plenum (FC055), and RG59, RG62 (FC090) connectors
- D-Sub Die—for FA810 and FA820 Crimping Pins
- RJ-45 Die—8-position modular die set for modular plugs
- Padded storage container

RG58/59 Round
Standard Ethernet
RG58/59 Hex
D-Sub
RJ-45

Item	Code	Price
LAN Tool Kit 100	FT060	**$335.00**

Fiber Stripping Kits The Rugged *and* Portable Fiber Stripping Kit.

- **Razor-sharp blades strip the buffer—but don't touch the cladding.**
- **Simple to use—learn how in minutes.**
- **Durable kits are perfect for heavy jobs in the field.**

Terminating a lot of fiber cable? This is your perfect portable Stripping Kit. You won't find a more reliable method for stripping 50-, 62.5-, and 100-micron fiber cable. Just follow these steps.

- Use the insulation stripper to remove the outer jacket of the fiberoptic cable.
- Use the heavy-duty shears to trim the cable's Kevlar® strength fibers.
- Use the fiberoptic stripper to remove the fiber buffer. The semicircular design of the blades stops them from cutting the cladding. Six pairs of opposed plastic teeth position the buffering perfectly and grip it as you pull the cable.

You get perfect cable stripping every time.

Item	Code	Price
To strip 50- or 62.5-micron core cable, order our…		
Fiber Stripping Kit 125	FT500	$98.00
To strip 100-micron core cable, order our…		
Fiber Stripping Kit 140	FT502	$98.00

What's in the Fiber Stripping Kit:

- Heavy-duty cable stripper
- Spring-loaded insulation stripper
- Rugged vinyl pouch
- Heavy-duty shears

Strip 50-, 62.5-, or 100-micron core cable

* * *

100X Inspection Microscope

Scope Out and Terminate Fiber Cables Precisely.

- **Field-inspect fiberoptic connectors.**
- **Inspect cleaved-bare fibers prior to terminating.**
- **Includes a universal adapter for connectors.**

Examine fiber ends, before and after cleaving operations, with the 100X Inspection Microscope. Use the Microscope to examine various single-mode and multimode connector types, including ST®, SC, FC, FDDI, and 2.5-mm.

The Microscope's molded positioner makes fiber alignment fast and accurate. Its holding feature secures the fiber, but still lets you rotate the fiber 180 degrees.

Black Box Explains…

Visual Examination of Fibers.

To examine fibers after stripping or to inspect the termination, you will need a microscope. A monocular type with 100X magnification is usually sufficient. This level of magnification makes a 62.5-micron fiber core appear to be about ten millimeters in diameter.

FAXBACK INFORMATION
Request Document Number: 17123
Call 412-746-5500 Anytime

Item	Code	Price
100X Inspection Microscope	FT890A	$189.95

* * *

LightCrimp Connector System

Make Professional ST or SC Fiberoptic Crimp Connections in Less than 2 Minutes.

- **Connections are neat and clean—no epoxy needed!**
- **Compliant with EIA/TIA standards.**
- **Upgrade your ST kit to an SC kit.**

Go from unfinished cable to ST or SC style connector assembly in minutes with the LightCrimp™ Connector System from Black Box. Its precision tools, connectors, and innovative crimp design make it easy to uncover a cable's fiber core and crimp it to another cable. Shear excess core material from your Connector and buff away any irregularities with the kit's custom-designed cleave tool and polish supplies.

What's in the LightCrimp ST Termination Kit:

- Cable stripper
- Cleave tool
- Polish bushing and plate
- Stripping template
- Scissors
- Crimp tool with die
- Fiber stripper
- Lapping films (15-, 5-, and 1-micron)
- Resilient pad
- Instructions

What's in the LightCrimp SC Termination Kit:

- Micro strip tool, .008
- Miller strip tool
- (2) Polishing bushings:
  - (1) metal,
  - (1) plastic
- Lapping film:
  - (10) Sheets 5 μm;
  - (10) Sheets 3 μm
- Polish pad
- Polish plate
- Cable prep template
- Scissors
- Cleave tool
- Cable stripper
- Hand tool with die set
- Carrying case

What's in the LightCrimp SC Termination Upgrade Kit:

- (2) Polishing bushings:
  - (1) metal,
  - (1) plastic
- Cleave tool
- Cable prep template
- Hand tool with die set

FAXBACK INFORMATION
Request Document Number: 17477
Call 412-746-5500 Anytime

FT510
FO010

LightCrimp is a trademark of AMP Incorporated. ST is a registered trademark of American Telephone and Telegraph Company.

Item	Code	Price
LightCrimp SC Termination Kit	FT512	$1095.95
LightCrimp SC Upgrade Kit	FT515	$539.95
SC Connectors		
Simplex	FO040	$14.95 each
Duplex	FO055	$25.95 each
LightCrimp ST Termination Kit	FT510	$1050.00
LightCrimp Bayonet Connectors (ST) 125-micron (Compatible with 50- and 62.5-micron Core Cable)	FO010	$10.50 each

MORE! Fiber Tools, see p. 159.

Innovative *and* Easy Fiber Connector Kits.

Fiber Connector Tool Kit No-Glue, No-Polish Ceramic-Tip Fiber Connection. Just Crimp!

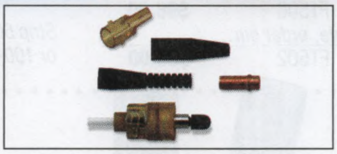
FT546 Crimp Tool

ST, SC, FC Connections

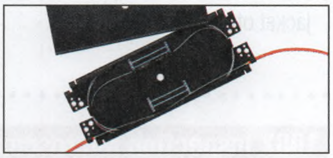
What's in the Fiber Connector Tool Kit:

- Installation Tool/Bench Clamp, Crimp Tool, and Fiber Optic Cleaver
- Assembly manual and video
- Buffer Tube Stripper
- Ruler, strip-length gauge, scissors, and tweezers
- Electrical tape, alcohol wipes, and marker

One push with the Fiber Optic Cleaver (FT538) cuts fiber cable cleanly.


The Connector housing, two sleeves, and two compression hood fittings make up the Pre-Polished Fiber Connector (FO031-R2).

OPEN
CLOSED
Stress-free splicing! No gluing or alignment problems (FO030).


Hold up to six splices securely in the Mechanical Splice Tray (WP602).

- **Get an instant ceramic-tip fiber connection.**
- **Pre-Polished Fiber Connectors handle ST, SC, and FC connections.**

Get ready for the easiest fiber connections you've ever made, with the Fiber Connector Tool Kit and Pre-Polished Fiber Connectors.

The rotating cam on the ST® and FC Pre-Polished Fiber Connectors make terminations quick and smooth. The Connectors require no polishing and no epoxy during installation, and there's no compromise in performance. An SC Connector is also available for fiber-to-desk applications.

All three Connectors come with a fiberoptic stub in the connector tip. The stub is already cemented firmly in place. It's polished to a physical-contact finish—the best available—for maximum signal and lowest light loss. Just insert a stripped and cleaved fiber cable into the Connector, match up the stub and fiber cable, and then crimp. The whole job takes less than a minute.

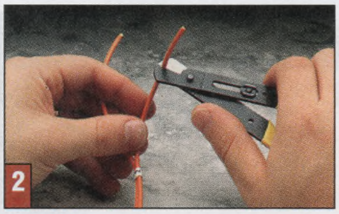
Mechanical Splice and Tray

Splicing fiber cables is faster, too, thanks to the No-Adhesive Mechanical Splice. Insert a stripped and cleaved fiber cable into each end of the Splice. Then twist. A cam locks the fibers into position for accurate alignment. To protect and organize your splices, use the Mechanical 6-Splice Tray.

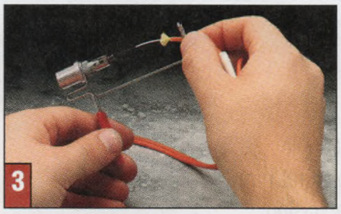
Item		Code	Price
Order your connectors and tool kit...			
Fiber Connector Tool Kit		FT535-R2	**$1595.00**
Pre-Polished Fiber Connector	ST	FO031-R2	**$33.95 each**
	SC	FO032	**$34.95 each**
	FC	FO033	**$33.95 each**
...or order the tools separately:			
Installation Tool/Bench Clamp		FT545	**$595.00**
Crimp Tool		FT546	**$295.00**
Fiber Optic Cleaver		FT538	**$500.00**
No-Adhesive Mechanical Splice (pkg. of 6)		FO030	**$200.00**
Mechanical 6-Splice Tray		WP602	**$51.00**

Hot Melt Connector System Install Ceramic-Tip Fiber Connectors Fast—No Epoxy, No Mess.

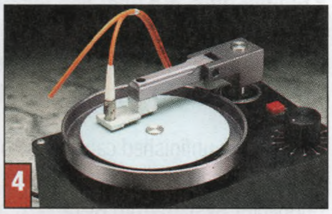
4 easy steps
ST Connections
1
Insert the Hot Melt Connector into the oven.



While the connector heats up, prepare the cable ends for termination.



Insert the fiber cable into the Hot Melt Connector. No epoxies or other adhesives to mess with.



Set the Connector in the Polishing Machine. Each Connector gets the most accurate polishing—automatically—for lowest light loss.

- **Hot Melt oven is portable—make connections *anywhere*.**
- **Adhesive is already loaded into the Connector.**
- **For ST style connectors.**

Terminate fiber with ceramic-tipped ST Connectors with Hot Melt. Each Connector is preloaded with Hot Melt adhesive. Just heat the Connector in the Hot Melt oven for 60 seconds and it's ready for stripped fiber cable.

The Tool Kit (FT520) contains the stripper, the oven, all the tools you need, Cooling Stand, holders, and polishing paper, in a briefcase-style case. Just order the Connectors, and you're ready to terminate cable in the field. An instructional video (included) shows you how easy it is.

Even if you already have another ST termination kit, you can still use Hot Melt Ceramic Connectors. Order our Conversion Kit and get only what you need to use Hot Melt ST Connectors—no duplicate tools. If you make numerous cables, order the polishing machine, so you don't have to polish by hand.

ST Connections

Long-lasting, ceramic ST Connectors provide the accuracy you need for fiber.

Item	Code	Price
Hot Melt Connector System		
Tool Kit	FT520	**$1695.00**
ST Connectors	FO020	**$12.70 each**
Accessories		
Conversion Kit	FT522	**$490.00**
Polishing Machine	FT525	**$1200.00**
Cooling Stand	FT532	**$49.00**
Holders Package (6)	FT533	**$84.00**
One-Step Hand-Polishing Paper	FT530	**$20.30**
One-Step Machine-Polishing Paper	FT531	**$20.30**

Wallmount Patch Panel Brackets

Rack 'em Up with These Easy-Install, Easy-Access Brackets.

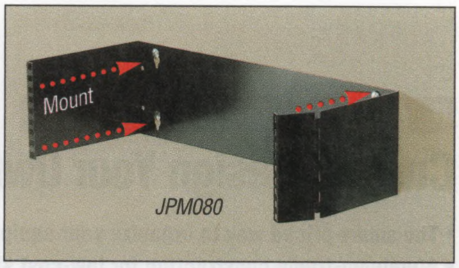
- Mounts 2, 3, or 4 Patch Panels.
- Mount the Brackets where you want. Universal hinging enables left or right opening.
- Mount to the wall or any standard 19" rack. Brackets accept either 10/32" or 12/24" screws.
- Durable 16-gauge steel construction ensures a long life.
- All Brackets are 19" wide and 8" deep.

Great Price!

Mount the Bracket where you want it! Universal hinging enables left or right opening.

SIZE SPECS

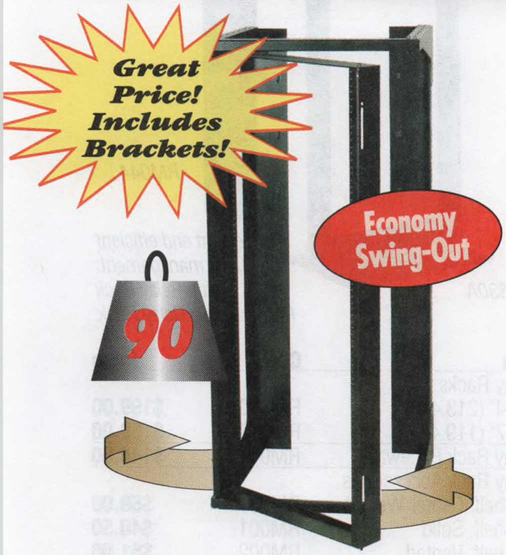
JPM082: 3.5"H x 19"W x 8"D (8.9 x 48.3 x 20.3 cm);
JPM081: 5.3"H x 19"W x 8"D (13.5 x 48.3 x 20.3 cm);
JPM080: 7"H x 19"W x 8"D (17.8 x 48.3 x 20.3 cm)



Item	Code	Price
Wallmount Patch Panel Brackets		
for 2 Patch Panels		
3.5"H (8.9 cm)	JPM082	$21.00
for 3 Patch Panels		
5.3"H (13.5 cm)	JPM081	$23.00
for 4 Patch Panels		
7.0"H (17.8 cm)	JPM080	$25.00

Wallmount Racks

Create More Floor Space—Wallmount Your Racks.

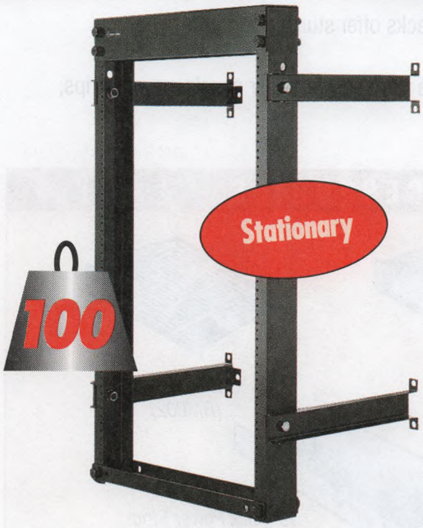


The Economy Swing-Out Rack (RM070A) with left- and right-opening quick-release hinges is a cost-effective way to save floor space.

Economy Swing-Out Rack

- Heavy-duty 16-gauge steel frame features left- or right-side quick-release hinges.
- Extra-deep design holds any data-communications equipment.
- Offers more convenience with built-in strain relief and cable management.
- Choose from two sizes.
- Brackets included for easy wall-mounting.
- 3" deep rack-style mounting rail holds rack securely to the wall.
- Pre-drilled holes meet EIA/TIA cabling standards for 19" wide equipment.
- Easy shipping—one carton via UPS.

Item		Code	Price
Swing-Out Rack, includes Brackets			
12 U, 24" H	(61 cm)	RM070A	$127.95
23 U, 48" H	(121.9 cm)	RM080A	$144.95



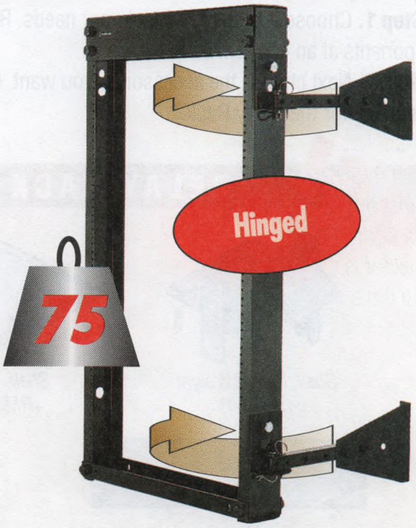
Wallmount Rack (RM040A) with Stationary Brackets (RM042)

Wallmount Rack with Stationary Brackets

- Choose from two sizes.
- Stationary brackets offer basic space-savings.
- Heavy-duty aluminum Racks provide rugged support. Same frame as Hinged Rack.
- Rack with Stationary Brackets can support up to 100 pounds (45.3 kg).
- Easy assembly—just tighten 12 bolts and you can mount it to the wall.
- Pre-drilled standard EIA hole spacing accommodates 19"-wide equipment.

FAXBACK INFORMATION
For Economy Swing-Out Rack: 19149,
For Stationary and Hinged Racks: 15530,
Call 412-746-5500 Anytime

MORE! Racks, see pp. 162–169.



The Wallmounted Rack (RM040A) with swing-out Hinged Brackets (RM043) saves floor space—and makes accessing your equipment even easier!

Wallmount Rack with Hinged Brackets

- Choose from two sizes.
- Hinged Brackets provide easier installation and equipment maintenance.
- Heavy-duty aluminum Racks provide rugged support. Same frame as Stationary Rack.
- Rack with Hinged Brackets supports up to 75 pounds (34 kg).
- Easy assembly—just tighten 12 bolds and you can mount it to the wall.
- Pre-drilled standard EIA hole spacing accommodates 19"-wide equipment.

Item		Code	Price
Wallmountable Racks (Brackets Sold Separately)			
36" H	(91.4-cm)	RM040A	$122.50
48" H	(122.0-cm)	RM041A	$125.00
Brackets			
Stationary (Set of 4)		RM042	$52.00
Hinged (Set of 2)		RM043	$68.25

Economical, Convenient Ways

Relay Racks • Relay Rack Raceway

Custom-Design Your Own Relay Rack.

PLUS! Comm Racks, see p. 166.

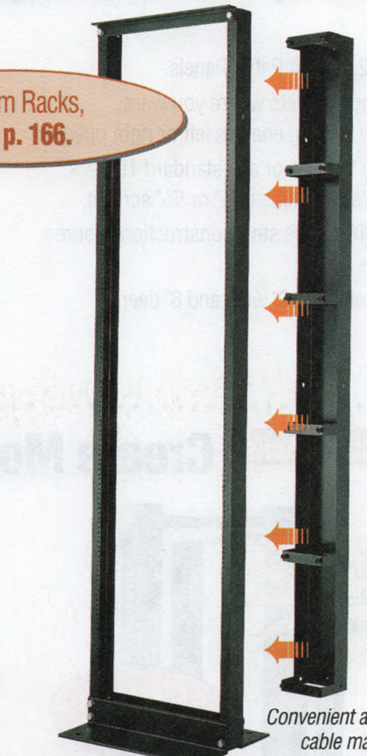
- **The smart-priced way to organize your equipment and your cables.**
- **Aluminum-frame construction for low-cost strength.**
- **Front and rear flanges are pre-drilled and tapped per EIA 568 for easy equipment mounting.**
- **Add the Relay Rack Raceway for easy cable management.**

Get organized! Relay Racks offer sturdy support for your components at an economical price. Choose the accessories you want: shelves, filler panels, and power strips.

Relay Rack Raceways provide the most convenient way to manage your cables—simply bolt to the side of a Relay Rack. With the Raceways' hinging and removable retainers for quick access to cables, organizing your wiring has never been simpler! Relay Rack Raceways are ideal for neatly routing cable runs, from the floor or ceiling to the back of your patch panels. Raceways are easy to install. And they're shipped to you fully assembled.

Step 1. Choose a system to meet your needs. Relay Racks offer sturdy support for your components at an economical price.

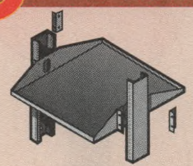
Step 2. Next choose the accessories you want. Choose from shelves, filler panels, power strips, and screws for the Relay Rack.



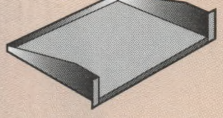
Convenient and efficient cable management: Bolt a Relay Rack Raceway to a Relay Rack.

PLUS!

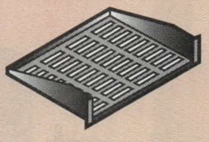
RELAY RACK ACCESSORIES



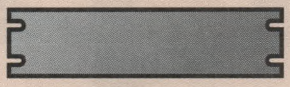
Shelf, Center Weight (RM331)



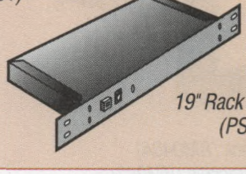
Shelf, Solid (RM001)



Shelf, Vented (RM002)



Flat Filler Panel, 7" (RM319)



19" Rack Power Strip (PS186A)

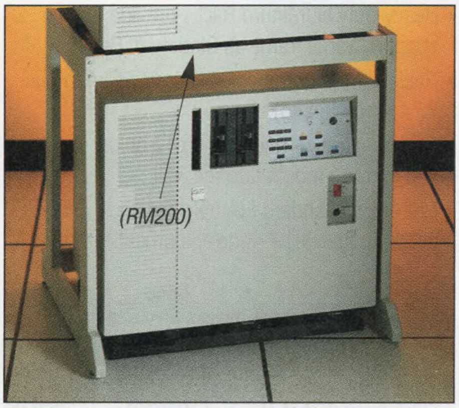
Item	Code	Price
Relay Racks		
84" (213.4 cm)	RM330A	**$199.00**
47" (119.4 cm)	RM332A	**$159.00**
Relay Rack Raceway	RM044	**$144.00**
Relay Rack Accessories		
Shelf, Center Weight	RM331	**$59.00**
Shelf, Solid	RM001	**$40.50**
Shelf, Vented	RM002	**$51.00**
Flat Filler Panel 1.75"	RM318	**$8.00**
Flat Filler Panel 7"	RM319	**$19.00**
Cup Head Screws (20)	RM328	**$5.00**
19" Rack Power Strip	PS186A	**$74.95**
19" Rack Surge Power Strip	SP187A	**$84.95**

Let our Tech Support Rack Specialists help design the perfect rack to suit your specific needs. Call us at **412-746-5500**.

FAXBACK INFORMATION
Request Document Number: 15547
Call 412-746-5500 Anytime

Controller Racks

Save Space—Stack Your Controllers.



Two 3174 Controllers fit perfectly on our 3174 Rack (RM200).

- **Built-in leveling legs firmly support your 3174 and 3274 controllers.**
- **Open-frame construction—service your controllers without removing them from the rack.**
- **14-gauge steel construction.**
- **Air circulates to cool temperature-sensitive equipment.**
- **Easy installation—with just a screwdriver.**

These Racks are strong! They're built with 14-gauge steel. Open-frame construction allows both air-cooling and easy access to your controllers. Installation is easy—in just a few minutes, your 3174 and 3274 controllers are safely stacked and out of the way.

PLUS! Cable Management and Power Protection, **see p. 169.**

SPECIFICATIONS

Size — 3174 Rack: 29.5"H x 31"W x 24.4"D (74.9 x 78.7 x 62 cm);
3274 Rack: 32.5"H x 33"W x 24.4"D (82.6 x 83.8 x 62 cm)

Weight — 3174 Rack: 38 lb. (17.2 kg);
3274 Rack: 39 lb. (17.7 kg)

Item		Code	Price
Controller Rack	3174	RM200	**$405.00**
	3274	RM205	**$405.00**

to Organize Your Equipment.

Rack Manager • Cable Manager

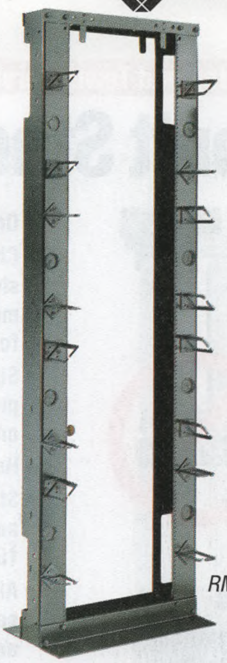
Relay Rack, Raceway, and Cable Routing—All in One Rack Unit.

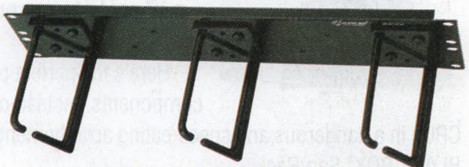
- **Drilled and tapped with either 10/32" or 12/24" mounting holes per EIA universal spacing.**
- **Hanger gives you 45-degree rotation.**
- **Includes all assembly hardware: 20 cable ties, 16 cable hangers, 40 cuphead screws, grommeting for cutouts, and plastic plugs for 2"-diameter holes.**

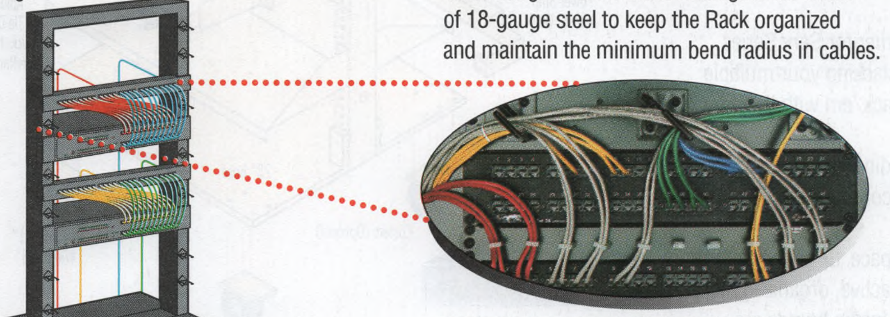
With the all-aluminum Rack Manager from Black Box, you can mount a variety of standard 19-inch patch panels, hubs, concentrators, and other datacomm equipment in a single rack with built-in cable ties and cable hangers for organized routing of wire and cable. In fact, you can easily double the space available for wire and cable routing!

Get the most out of the space you have. Ten outlets take up only 1¾" of rack height. Optional Latch-Type or Hanger-Type Cable Managers are also available. Latch-Type Cable Managers are completely assembled with small latch gates. The Hanger-Type Cable Managers have mounting holes that enable vertical positioning of large cable hangers. Both Cable Managers are made of 18-gauge steel to keep the Rack organized and maintain the minimum bend radius in cables.

JPM146A


RM350A


JPM147A



SPECIFICATIONS

Construction — Aluminum with black polyurethane finish

Size — 84"H x 19"W x 15"D (213.4 x 48.3 x 38.1 cm)

Item	Tapped Hole Size	Code	Price
Rack Manager	10/32"	RM350A-R2	$400.00
	12/24"	RM351A-R2	$400.00
Cable Manager			
Latch		JPM146A	$10.00
Hanger		JPM147A	$45.00

FAXBACK INFORMATION
Request Document Number: 12616
Call 412-746-5500 Anytime

Wallmount Cabinets

Organize Your Rack Equipment and Cables the Wallmount Way!

- **Wallmount Cabinets accommodate 19-inch rack equipment where there's no space for a freestanding rack.**
- **Mounting rails on the Wallmount Cabinets are adjustable for 10/32" and 12/24" tapped holes.**
- **Plexiglas door can be hinged left or right. Completely assembled with small latch gates or cable hangers.**

These Cabinets mount to the wall, so they're ideal for computer rooms where there's no room for a full-size freestanding rack or cabinet.

Plexiglas® front cabinet doors give you instant visual access to your equipment, and they lock for added security.

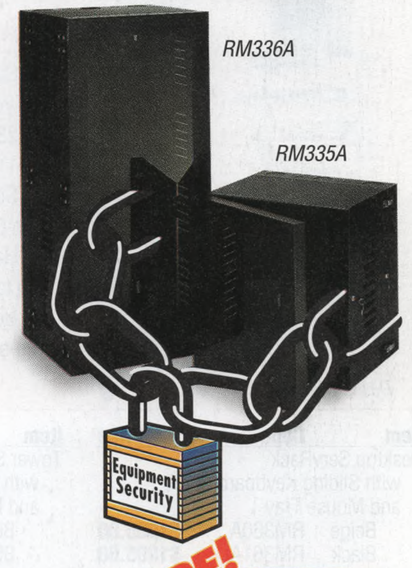
The mounting system and hinged cabinet doors give you equipment access from the front and back. And top and bottom knockouts provide easy access and hide unsightly wires.

*NOTE: Remember to also buy a Power Strip. See the Relay Rack Accessories listed on **page 162** or turn to **page 169** for additional information.*

SPECIFICATIONS

Construction — Heavy-duty 14- and 16-gauge steel; textured finish with black polyurethane baked-on paint

Size — RM335A: 23.6"H x 21.2"W x 14.2"D (59.9 x 53.8 x 36.1 cm), holds 12 rack units; RM336A: 48.1"H x 21.3"W x 14.2"D (122.2 x 54.1 x 36 cm), holds 26 rack units



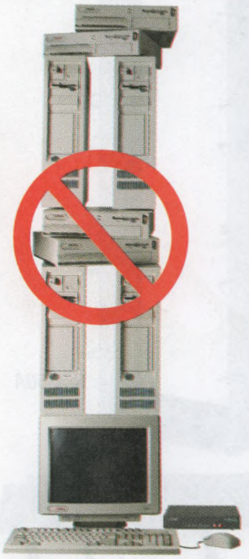
Item	Height	Code	Price
Wallmount Cabinets	23.6 inches (59.9 cm)	RM335A	$525.00
	48.1 inches (122.2 cm)	RM336A	$750.00
You may also need...			
Color-Coded Cable Labels		FT931	$49.95
For more Cable Manager Accessories, see p. 171.			
Wallmount Patch Panel Brackets for 2 Patch Panels		JPM082	$21.00

For Brackets to hold even more Patch Panels, see p. 161.

MORE! Wallmount Racks, see p. 161.

Desktop and Tower ServRacks

Don't Stack 'em—Rack 'em.



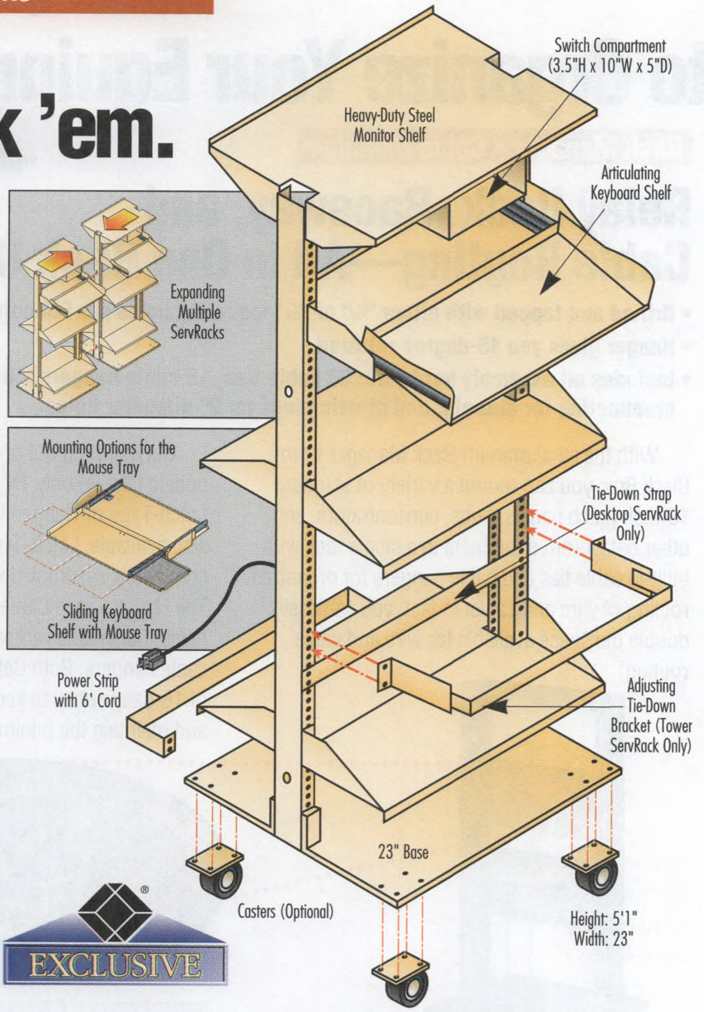
- **Organize your desktop or tower servers.**
- **Choose from two easy-sliding keyboard shelves—either a sliding shelf with mouse tray or an articulating shelf for easy viewing.**
- **Six-outlet power strip with surge protection can be mounted anywhere on your rack.**
- **Heavy-duty monitor shelf holds 75 pounds.**
- **Sturdy steel CPU shelves are adjustable and double-sided. They hold up to 100 pounds each.**
- **All assembly hardware is included and packed flat for easy shipping. All you need is a Phillips screwdriver and a ¾" socket or wrench.**

Here's the perfect partner for Serv Series components. Instead of stacking your multiple CPUs in a dangerous and space-eating arrangement, rack 'em with the BLACK BOX® ServRack.

This exclusive rack has all the best features—including keyboard drawers with heavy-duty ball-bearing slides, a standard switch compartment, tie-down brackets, and a power strip. You get it all!

With the ServRack, you clean up clutter and save space. Simply arrange four CPUs, one keyboard, and one monitor on one attractive, organized rack. You prevent your equipment from falling over, and the inside boards are protected from dangerous jostling.

Sturdy steel monitor and CPU shelves stand up to your heaviest equipment. And the upright channels are predrilled for even more expansion options.


Switch Compartment (3.5"H x 10"W x 5"D)
Heavy-Duty Steel Monitor Shelf
Articulating Keyboard Shelf
Expanding Multiple ServRacks
Mounting Options for the Mouse Tray
Sliding Keyboard Shelf with Mouse Tray
Power Strip with 6' Cord
Tie-Down Strap (Desktop ServRack Only)
Adjusting Tie-Down Bracket (Tower ServRack Only)
23" Base
Casters (Optional)
Height: 5'1"
Width: 23"
EXCLUSIVE

You can order the Rack in standard black or beige. Custom colors are available, too—just call.

The ServRack. It's smart. It saves space. And it's a wonderful way to simplify your workplace.

Tower ServRack

Desktop ServRack

Both Racks Come with:

- (1) Steel monitor shelf with switch compartment for your 2- or 4-port Switch.
- (1) 23" sliding keyboard shelf with mouse extension or (1) articulating keyboard shelf for easy viewing.
- (1) Six-outlet surge-protected power strip with 6-ft. power cord.
- (2) Heavy-duty extruded aluminum drilled and tapped uprights.
- (2) Heavy-duty extruded aluminum free-standing bases.

PLUS! Your Desktop ServRack *Also* Comes with:

- (4) Fully adjustable steel double-sided rack shelves that mount back to back.
- (4) Pairs of tie-down straps to secure your CPUs.

PLUS! Your Tower ServRack *Also* Comes with:

- (2) Fully adjustable steel double-sided rack shelves that mount back to back.
- (2) Pairs of adjusting brackets and tie-down straps to secure your CPUs.

Item	Code	Price
Desktop ServRack		
with Sliding Keyboard Shelf and Mouse Tray		
Beige	RM360A	$1095.00
Black	RM361A	$1095.00
with Articulating Keyboard Shelf		
Beige	RM362A	$1095.00
Black	RM363A	$1095.00

Item	Code	Price
Tower ServRack		
with Sliding Keyboard Shelf and Mouse Tray		
Beige	RM364A	$1095.00
Black	RM365A	$1095.00
with Articulating Keyboard Shelf		
Beige	RM366A	$1095.00
Black	RM367A	$1095.00

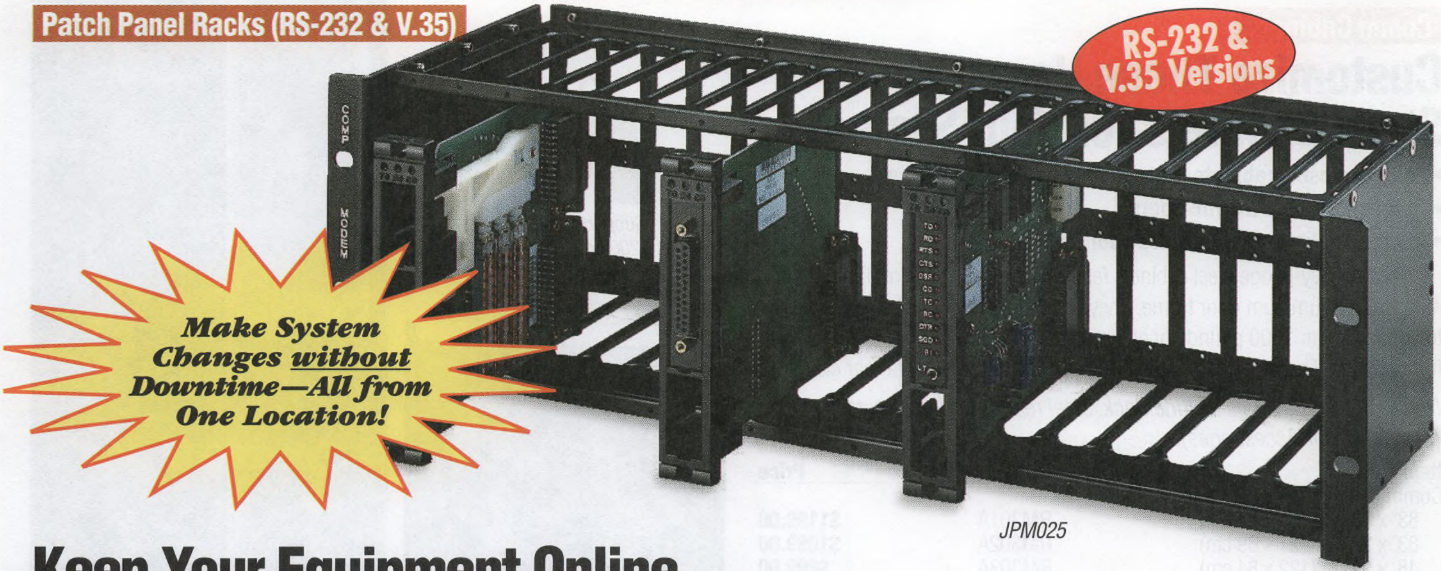
ABSOLUTELY GUARANTEED FOR LIFE

Item	Code	Price
Optional Casters (4)	RM369	$95.00

FAXBACK INFO
Request Document Number: 15561
Call 412-746-5500
Anytime

Need a specific color? Just give us a call!

Patch Panel Racks (RS-232 & V.35)



JPM025

Keep Your Equipment Online with This Manual Patching System.

Patch Panels Provide a Reliable and Cost-Effective Way To:

- **Reconfigure your network.**
- **Restore service to equipment that goes down.**
- **Troubleshoot your system.**
- **Move large numbers of lines to a backup device.**
- **Change line routing.**
- **Rearrange connections between modems and terminals.**
- **Patch monitoring equipment into whatever line you want.**
- **Test either the DTE or DCE side of any connected line from one location.**

PLUS!

You Get These Features:

- **RS-232 and V.35 versions—both rackmountable.**
- **Monitoring Module with 11 LEDs allows you to check port-communications status on 16 patch panels via patch cable.**
- **Test Module allows diagnostic equipment to be connected to the patch panels.**
- **Standard Patch Panel Rack accommodates RS-232, V.35, EIA-530, and X.21 interfaces.**
- **Spectron compatible.**

Improve your network's productivity and cut system downtime—all from one location. These Patch Panels provide a reliable and cost-effective way to reconfigure your network, restore service to equipment that goes down, and troubleshoot your system.

In minutes, you can move large numbers of lines to a backup device, or change line routing to get more data-processing capability. Quickly rearrange connections between modems and terminals. Easily patch monitoring equipment into whatever line you want. Test either the DTE or DCE side of any connected line from one location. And do it all with simple, reliable manual connections.

The BLACK BOX® Basic Patch Panel Rack has a Monitoring Module with 11 LEDs to check port-communications status on the 16 patch panels via patch cable. With its Test Module, you can attach diagnostic equipment to the patch panels. It accommodates RS-232 and V.35 modules.

The BLACK BOX® Standard Patch Panel Rack accommodates RS-232, V.35, EIA-530, and X.21 interfaces. It includes the Monitoring Module with LEDs on each of the 16 patch panels to give you a quick status report on Transmit, Receive, and Carrier functions.

Patch Panels are Spectron® compatible. Kits include one Chassis, 16 Patch Modules, and one of each other item listed with each Kit.

Both the Basic and the Standard Patch Panels are rackmountable. Each Patch Cord features simple insertion with positive locking for a secure, stable connection. (Specify connector style when ordering.)

SPECIFICATIONS

Protocol — Transparent

CE Approval — JPM060–JPM063C, JPM065C–JPM067C, JPM070–JPM072C, JPM074C, JPM077C–JPM078C

Interface — RS-232

Connectors — Patch Modules: Computer ports are female, Modem ports are male; Connector is DB25 for RS-232, M34 for V.35; Monitoring and Test Modules: (1) DB25 female on front; Connector on back is DB25 female for RS-232, M34 female for V.35

Power — 115 VAC, 60 Hz

Size — 5.3"H x 19"W x 6"D (13.5 x 48.3 x 15.2 cm)

Item	Code	Price
RS-232 Basic Patch Panel Rack Kit	JPM025	$1299.00
Chassis	JPM060	$129.00
Modules		
RS-232/530 Patch	JPM062C	$59.00
232 Monitoring	JPM066C	$159.00
RS-232/V.35 Test	JPM065C	$109.00
V.35 Basic Patch Panel Rack Kit	JPM026	$2395.00
Chassis	JPM061	$1269.00
Modules		
V.35 Patch	JPM063C	$59.00
V.35 Monitoring	JPM067C	$159.00
RS-232 Standard Patch Panel Rack Kit	JPM027	$1799.00
Chassis	JPM070	$349.00
Modules		
RS-232 Patch with 3 LEDs	JPM072C	$89.00
RS-232 Monitoring	JPM077C	$129.00
Blank Panel	JPM079	$5.00
V.35 Standard Patch Panel Rack Kit	JPM028	$3199.00
Chassis	JPM071	$1459.00
Modules		
V.35 Patch with 3 LEDs	JPM074C	$109.00
V.35 Monitoring	JPM078C	$129.00
Patch Cable		
2-ft. (0.6-m)	JPM015	$52.00
6-ft. (1.8-m)	JPM017	$57.00

remember to order cables

Comm Cabinets

Customize These Versatile Steel Cabinets for Your System.

- **Fully enclosed cabinets protect your valuable equipment.**
- **Optional steel or acrylic doors.**
- **Casters make it easy to move your Rack.**

These heavy-gauge steel cabinets feature adjustable steel mounting rails and an aluminum door frame. They have the stability and strength to support up to 1200 pounds of equipment but are still easy to take down for transport. The RM301A and RM303A are 30" deep for extra rear clearance.

*NOTE: Comm Cabinets include: rack, steel rear door, legs, casters (see **below** for Accessories).*

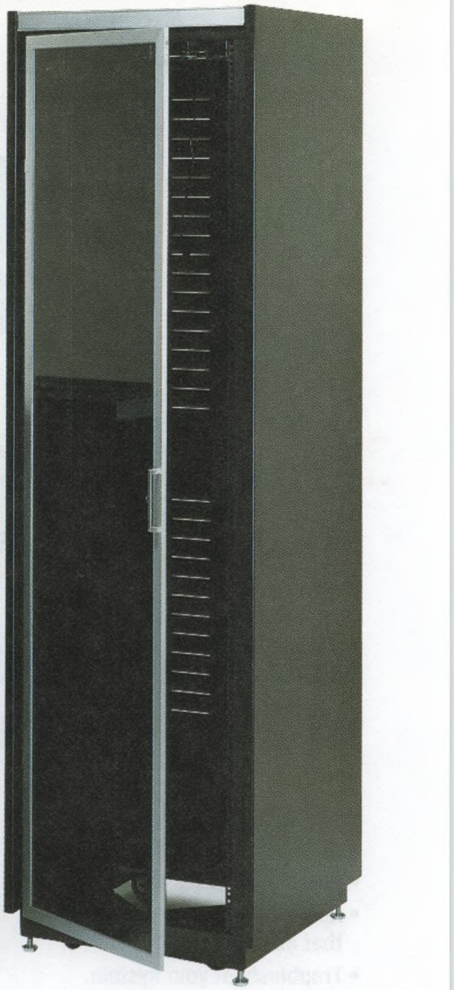
Item	Code	Price
Comm Cabinets (Outside Dimensions)		
83" x 33" (21 x 84 cm)	RM301A	**$1199.00**
83" x 27" (21 x 69 cm)	RM302A	**$1099.00**
48" x 33" (122 x 84 cm)	RM303A	**$899.00**
48" x 27" (122 x 69 cm)	RM304A	**$829.00**

Let our Tech Support Rack Specialists help design the perfect rack to suit your specific needs. Call us at **412-746-5500**.

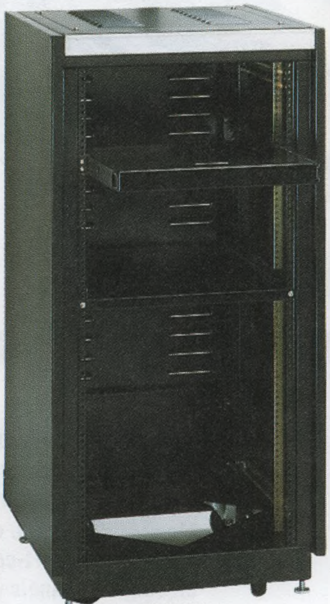
COMM CABINET ACCESSORIES

Accessories	Comm Cabinet Size 83" x 33" RM301A	83" x 27" RM302A	48" x 33" RM303A	48" x 27" RM304A
Plexi Door, Locking	RM305 **$399.00**	RM305 **$399.00**	RM307 **$299.00**	RM307 **$299.00**
Plexi Door, Nonlocking	RM306 **$329.00**	RM306 **$329.00**	RM308 **$229.00**	RM308 **$229.00**
Short Steel Door, Vented	RM309 **$189.00**	RM309 **$189.00**	RM310 **$119.00**	RM310 **$119.00**
Standard Steel Door, Vented	RM311 **$289.00**	RM311 **$289.00**	RM312 **$199.00**	RM312 **$199.00**
Lock, Steel Door Only	RM313 **$29.00**	RM313 **$29.00**	RM313 **$29.00**	RM313 **$29.00**
Flat Filler Panel, 1.75"	RM318 **$8.00**	RM318 **$8.00**	RM318 **$8.00**	RM318 **$8.00**
Flat Filler Panel, 7"	RM319 **$19.00**	RM319 **$19.00**	RM319 **$19.00**	RM319 **$19.00**
630 CFM Fan Tray	RM321 **$179.00**	RM320 **$159.00**	RM321 **$179.00**	RM320 **$159.00**
Leg Levelers (4) Replacement	RM322 **$12.00**	RM322 **$12.00**	RM322 **$12.00**	RM322 **$12.00**
Casters (4) Replacement	RM323 **$49.00**	RM323 **$49.00**	RM323 **$49.00**	RM323 **$49.00**
Shelf, Solid	RM316 **$49.00**	RM314 **$39.00**	RM316 **$49.00**	RM314 **$39.00**
Shelf, Vented	RM317 **$59.00**	RM315 **$49.00**	RM317 **$59.00**	RM315 **$49.00**
Drawer, 3.5" with Lid	RM324 **$189.00**	RM324 **$189.00**	RM324 **$189.00**	RM324 **$189.00**
Drawer, 10" Open	RM325 **$199.00**	RM325 **$199.00**	RM325 **$199.00**	RM325 **$199.00**
Shelf, 18" Sliding	RM326 **$109.00**	RM326 **$109.00**	RM326 **$109.00**	RM326 **$109.00**
Cage Nuts (20)	RM327 **$15.00**	RM327 **$15.00**	RM327 **$15.00**	RM327 **$15.00**
Cup Head Screws (20)	RM328 **$5.00**	RM328 **$5.00**	RM328 **$5.00**	RM328 **$5.00**
Multi-Bay Joining Kit	RM329 **$9.00**	RM329 **$9.00**	RM329 **$9.00**	RM329 **$9.00**
19" Rack Power Strip	PS186A **$74.95**	PS186A **$74.95**	PS186A **$74.95**	PS186A **$74.95**
19" Rack Surge Power Strip	SP187A **$84.95**	SP187A **$84.95**	SP187A **$84.95**	SP187A **$84.95**
70" Rack Power Strip	PS187A-R2 **$79.95**	PS187A-R2 **$79.95**		

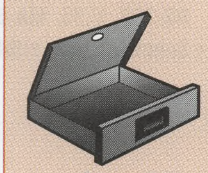
Supports up to 1200 pounds of equipment!



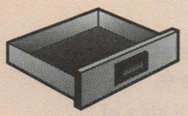
RM301A



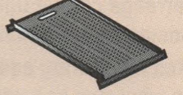
RM303A



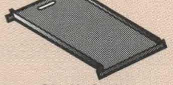
Drawer, 3.5" with Lid (RM324)



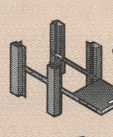
Drawer, 10", Open (RM325)



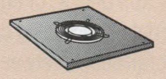
Shelf, Vented (RM317)



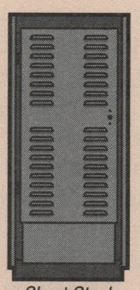
Shelf, Solid (RM316)



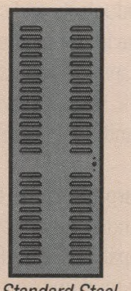
Shelf, 18" Sliding (RM326)



630 CFM Fan Tray (RM321)



Short Steel Door, Vented (RM309)



Standard Steel Door, Vented (RM311)

MORE! Racks and Cabinets, **see pp. 161–169.**

NetRack

At Last—A Cabinet that's Ready to Use! No Assembly Required.

- **Fully welded and assembled. Ready to use right out of the box.**
- **Sturdy, heavy-gauge steel construction holds whatever you can load in it.**
- **Locking front and rear doors provide extra security.**
- **No guesswork! Includes two shelves, removable top and side panels, and doors.**
- **Extra deep and wide cabinet gives you lots of built-in space for cabling.**
- **Front door can open from left or right with quick-change pins.**
- **Optional Fan Panels, Shelves, and Casters available. Also compatible with Comm Cabinet accessories on page 166.**

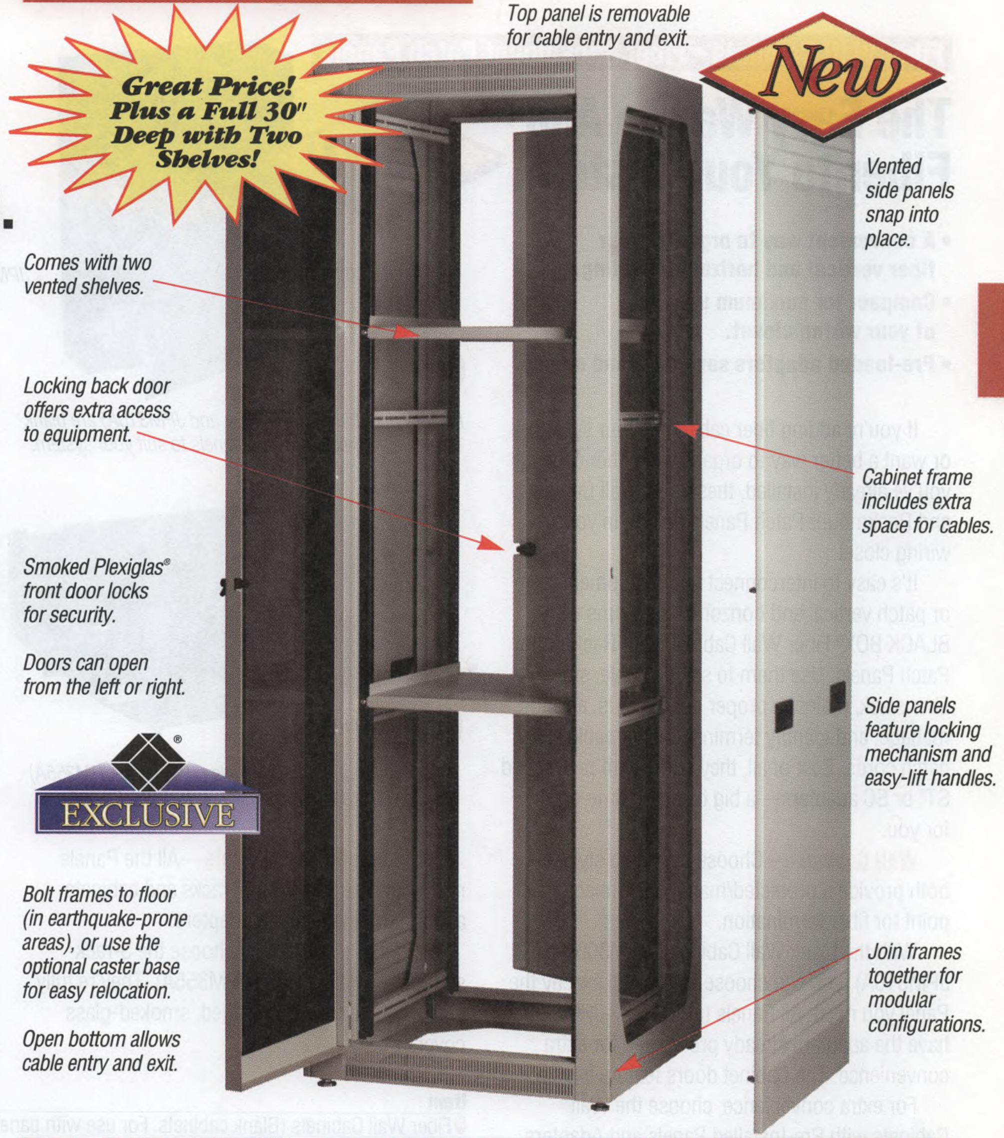
You're a networking expert—not an assembler. You may not even have the personnel available to put together the racks you order. The solution? Check out our easy, one-step NetRack. This sturdy, welded, heavy-gauge steel cabinet comes fully assembled. You can start loading it with equipment the day you receive it.

The NetRack is designed for you. It's loaded with all the features networking professionals want: security, easy access to equipment and cabling, heavy-gauge steel construction for durability, and modular features for expansion.

Both the front Plexiglas® door and the rear, vented-steel doors on the NetRack lock so you can use it in computer rooms, wiring closets, equipment rooms without worrying about equipment safety. And you can change the front door from left to right opening with the quick-release pins at the top and bottom of the NetRack.

The extra deep and wide construction of the NetRack gives you plenty of room for equipment and cable. There's room inside the frame of the cabinet for large bundles of cable. And you can remove the top panel to run cable through the rack. Even the top of the rear frame includes standard knockouts for cables. The two vented shelves (included) are adjustable, so you can arrange your equipment as you like.

If your needs change, you can add on to your NetRack. Go modular and remove the side panels of the NetRack. Easy-lift handles are built right in. Then join the NetRack frame to other racks or cabinets. Finish your expansion with optional top fan panels, shelves, and casters. And for more versatility, the Comm Cabinet Accessories on **page 166** will fit the NetRack.


Great Price! Plus a Full 30" Deep with Two Shelves!
New
Top panel is removable for cable entry and exit.
Vented side panels snap into place.
Comes with two vented shelves.
Locking back door offers extra access to equipment.
Cabinet frame includes extra space for cables.
Smoked Plexiglas® front door locks for security.
Doors can open from the left or right.
Side panels feature locking mechanism and easy-lift handles.
EXCLUSIVE
Bolt frames to floor (in earthquake-prone areas), or use the optional caster base for easy relocation.
Open bottom allows cable entry and exit.
Join frames together for modular configurations.

Optional Top Fan Panel (RM501) *Optional Caster Base (RM503)* *Optional Sliding Shelves (RM502)*

SPECIFICATIONS

Material — 12-gauge steel
Size — 78"H x 19"W x 30"D (198 x 48.3 x 76 cm)
Weight — 275 lb. (124.7 kg)

NOTE: The NetRack's shipping height is approximately 84" (the height of a pallet), and it ships via ground.

FAXBACK INFORMATION
Request Document Number: 18636
Call 412-746-5500 Anytime

Item	Code	Price
NetRack (Includes 2 Shelves) 78" x 19" x 30"		
Black	RM500A	**$1195.95**
Beige	RM505A	**$1195.95**
Top Fan Panel		
Black	RM501	**$169.95**
Beige	RM506	**$169.95**
Bottom-Mount Tower Shelves (2 Shelves)		
Black	RM502	**$199.95**
Beige	RM507	**$199.95**
Extra Stationary Shelves		
Black Solid	RM314	**$39.00**
Perforated	RM315	**$49.00**
Beige Solid	RM614	**$39.00**
Perforated	RM615	**$49.00**
Caster Base		
Black	RM503	**$179.95**
Beige	RM508	**$179.95**

Fiber Wall Cabinets • Fiber Rackmount Patch Panels

The Easy Way to Add Fiber to Your System.

- **A convenient way to organize your fiber vertical and horizontal cabling.**
- **Compact for maximum use of your wiring closet.**
- **Pre-loaded adapters save time and money.**

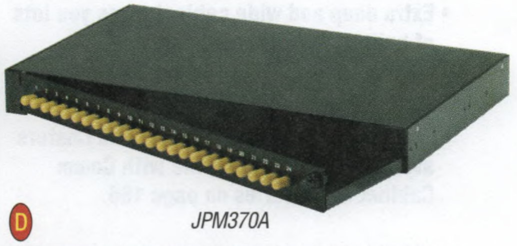
New
JPM300A
A

Fiber Wall Cabinets (JPM300A and JPM310A) are blank so you can mix and match panels to suit your system.

Pre-Loaded Adapters!
JPM325A
B

Fiber Wall Cabinets (JPM320A–JPM335A) come with pre-loaded panels for more convenient installations.

Fiber Rackmount Patch Panels (JPM340A–JPM355A) come with adapters and take up three rack positions.



Fiber Rackmount Patch Panels (JPM360A–JPM375A) come with adapters and occupy only one rack slot.

If you're adding fiber cabling to your system, or want a better way to organize the fiber cabling you've already installed, these new Wall Cabinet and Rackmount Patch Panels belong in your wiring closet.

It's easy to interconnect your equipment or patch vertical and horizontal fiber runs with BLACK BOX® Fiber Wall Cabinets and Rackmount Patch Panels. Use them to secure cable, store fiber slack, maintain proper bend radius, arrange, manage, and identify terminated fiber cable and patch cords. Best of all, they come with pre-loaded ST® or SC adapters—a big cost and time-saver for you.

Wall Cabinets—Choose from two styles—both provide a protected/managed connection point for fiber termination.

With the blank Wall Cabinets (JPM300A–JPM310A), you can choose and install exactly the Panel you need. All Panels (JPM302A–JPM314A) have the adapters already pre-loaded for extra convenience. The Cabinet doors feature a latch.

For extra convenience, choose the Wall Cabinets with Pre-Installed Panels and Adapters (JPM320A–JPM335A).

SPECIFICATIONS

Material — 16-gauge cold-rolled steel

Fiber Wall Cabinets:
Size — JPM300A: 10"H x 7.5"W x 2.5"D
(25.4 x 19 x 6.4 cm);
JPM310: 10"H x 10"W x 2.5"D
(25.4 x 25.4 x 6.4 cm)

Fiber Wall Cabinets with Installed Panels/Adapters:
Size — JPM320A, JPM325A: 12"H x 14"W x 3.3"D
(30.5 x 35.6 x 8.3 cm);
JPM330A, JPM335A: 16"H x 14"W x 6.5"D
(40.6 x 35.6 x 16.5 cm)

Fiber Rackmounted Patch Panels, 3-Rack Slots:
Size — JPM340A, JPM345A: 5.3"H x 17"W x 11.5"D
(13.5 x 43.2 x 29.2 cm);
JPM350A, JPM355A: 7"H x 17"W x 11.5"D
(17.8 x 43.2 x 29.2 cm)

Fiber Rackmounted Patch Panels, 1-Rack Slot:
Size — JPM360A, JPM365A, JPM370A, JPM375A:
1.8"H x 17"W x 11"D (4.6 x 43.2 x 27.9)

Rackmount Patch Panels—All the Panels mount in both 19" and 23" racks and cabinets and are pre-loaded with adapters.

For large installations, choose the 3-rack slot models (JPM340A–JPM355A). They're fully enclosed and feature a hinged, smoked-glass cover.

The 1-Rack Panels (JPM360A–JPM375A) feature a swing-out fiber management tray for full-front access.

FAXBACK INFORMATION
Request Document Number: 18629
Call 412-746-5500 Anytime

Item			**Code**	**Price**
Ⓐ Fiber Wall Cabinets (Blank cabinets. For use with panels JPM302A–JPM314A **below**)				
6/12 Fiber Adapters			JPM300A	**$104.95**
12/24 Fiber Adapters			JPM310A	**$114.95**
Wall Cabinet Fiber Panels with Installed Adapters (For use with Fiber Wall Cabinets **above**)				
6-Port	ST	6 Multimode Adapters	JPM302A	**$46.95**
	SC	3 Duplex Multimode Adapters	JPM304A	**$79.95**
12-Port	ST	12 Multimode Adapters	JPM306A	**$81.95**
	SC	6 Duplex Multimode Adapters	JPM308A	**$145.95**
24-Port	ST	24 Multimode Adapters	JPM312A	**$149.95**
	SC	12 Duplex Multimode Adapters	JPM314A	**$279.95**
Ⓑ Fiber Wall Cabinets with Installed Panels and Adapters				
24-Port	ST	24 Multimode Adapters	JPM320A	**$339.95**
	SC	12 Duplex Multimode Adapters	JPM325A	**$439.95**
48-Port	ST	48 Multimode Adapters	JPM330A	**$549.95**
	SC	24 Duplex Multimode Adapters	JPM335A	**$799.95**
Ⓒ Fiber Rackmount Patch Panels with Installed Adapters (3-Rack Slots)				
24-Port	ST	24 Single-Mode/Multimode Adapters	JPM340A	**$459.95**
	SC	12 Duplex Single-Mode/Multimode Adapters	JPM345A	**$569.95**
48-Port	ST	48 Single-Mode/Multimode Adapters	JPM350A	**$612.95**
	SC	24 Duplex Single-Mode/Multimode Adapters	JPM355A	**$839.95**
Ⓓ Fiber Rackmount Patch Panels with Installed Adapters (1-Rack Slot)				
12-Port	ST	12 Single-Mode/Multimode Adapters	JPM360A	**$269.95**
	SC	6 Duplex Single-Mode/Multimode Adapters	JPM365A	**$349.95**
24-Port	ST	24 Single-Mode/Multimode Adapters	JPM370A	**$369.95**
	SC	24 Duplex Single-Mode/Multimode Adapters	JPM375A	**$462.95**

You may also need:

Fiber Connector Kits and Microscope		**See pages 159–160.**
Fiber Cable Testers		**See page 215.**
remember to order cables — Duplex Fiber Optic Cable, PVC, ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific lengths or bulk cable, see pp. 74 and 118.

In This Section...
Hand Tools
Utility Cords
Tool Kits
Connector Kits

Rackmount Power Strips and Surge Suppressors

Organize Your Power Cords with Rackmountable Power Strips and Surge Suppressors.

Affordable Outlet Strip!
330-V Clamping Level

Top: Front of Rackmount Power Strip, Switchless (PS188A); Middle: Rackmount Surge Suppressor (SP187A); Bottom: Back of Premium Rackmount Surge Suppressor (SP215A)

Right: 70" Rack Power Strip (PS187A-R2)

- **Keep your rack neat with a Power Strip and plug all your equipment into one central location in your rack.**
- **Organize tangled power cords in your rack.**
- **Choose models with or without switches.**
- **Get surge protection with the SP models.**
- **Installation is fast and easy. Just bolt onto the cabinet rails, plug your equipment into the Strip, and then plug the Strip into an AC outlet.**

Get rid of that snake pit of power cords behind your rack. A Power Strip from Black Box can help you keep your rack neat: Plug all your components into one central location within your rack. Choose models with and without surge protection.

Power Strips

The 19" Rack Power Strips are easy to mount to the rails in any standard 19-inch rack and provide six handy outlets. The PS186A and PS189A both feature a switch/pilot light. The PS189A is designed with front-access outlets spaced 3" apart to hold multiple AC transformers. The PS188A is switchless so you can't accidentally trip the ON/OFF switch.

The 70" PS187A-R2 mounts vertically in our 83-inch Relay Racks and Comm Cabinets, shown on **pages 162** and **166**.

Rackmount Surge Suppressors

The 19" Rack Surge Power Strip features six outlets and surge protection rated at 15 amps, 125 volts.

The SP187A and SP211A offer standard surge protection. The Premium model, SP215A, offers extra-sensitive protection and fail-safe shutdown circuitry that cuts power should the surge element fail.

The SP211 is switchless to prevent accidental shutoffs.

VIPreview
Ask for our **Data & Equipment Protection VIPreview.**

FAXBACK INFO
Request Document Number: 16490
Call 412-746-5500
Anytime

RACKMOUNT POWER STRIPS AND SURGE SUPPRESSORS

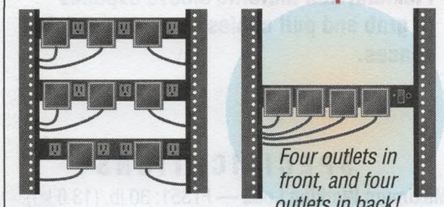
Description	On/Off Switch	Outlets	Surge Protection	Clamping Voltage	IEEE Let-Through	EMI/FRI Noise	Single-Pulse Energy Rating	Peak Current	Code	Price
19" Rackmount Power Strip, Switchable	✓	6 Rear							PS186A	**$74.95**
Switchless		6 Rear							PS188A	**$69.95**
Front Access	✓	6 Front							PS189A	**$69.95**
70" Rackmount Power Strip		11 Front							PS187A-R2	**$79.95**
400 V Rackmount Surge Suppressor	✓	6 Rear	✓	400 V	336V	40 dB	210 joules	13,000 Amps	SP187A	**$79.95**
400 V Rackmount Surge Suppressor, Switchless		6 Rear	✓	400 V	336V	40 dB	210 joules	13,000 Amps	SP211A	**$79.95**
Premium Rackmount Surge Suppressor		6 Rear	✓	330 V	260 V	60 dB	420 joules	33,000 Amps	SP215A	**$123.95**

◆ ◆ ◆

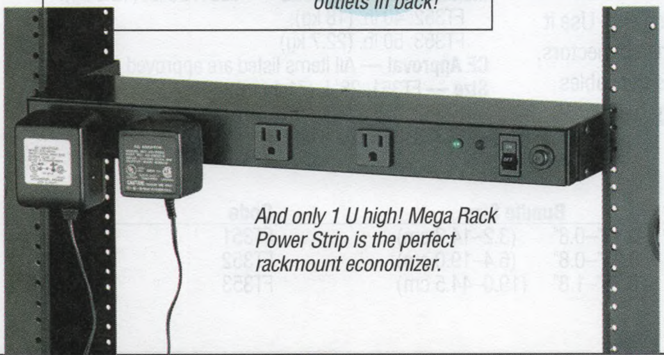
Mega Rack Power Strip

State-of-the-Art Surge Protection. *Plus* Plenty of Room to Plug In up to Eight Transformers!

Why Buy 3... ...When 1 Mega Rack Power Strip Will Do?



Four outlets in front, and four outlets in back!



And only 1 U high! Mega Rack Power Strip is the perfect rackmount economizer.

- **Ingenious design accommodates multiple AC power units.**
- **Outlets are rotated 90° to fit most transformers.**
- **UL® rated 15 amp, 125 VAC, 50 Hz, 1875 watts.**

Money and space are precious commodities. Save *both* when you install a Mega Rack Power Strip. It's compact—only 1 U high. Designed to fit a standard 19-inch data-center rack, Mega Rack has four outlets in front and four in back, each spaced 2.1" apart and rotated 90°. You have plenty of room to install transformers side-by-side. In fact, you can power up to eight devices from a single Mega Rack without wasting space on empty outlets.

The Mega Rack can even be recessed into your data-center rack to protect the transformers from being accidentally knocked loose. Best of all—you don't have to buy extra power strips.

SPECIFICATIONS

EMI/RFI Noise Protection — 20 dB
IEEE Let-Through Voltage — < 340 V
Single-Pulse Energy Rating — 360 Joules
UL® 1449 Clamping Level — 400 V
Power — 115 VAC, 60 Hz
Size — 1.7"(1U)H x 17"W x 4.5"D
(4.3 x 43.2 x 11.4 cm)
Weight — 5 lb. (2.3 kg)

FAXBACK INFORMATION
Request Document Number: 16452
Call 412-746-5500 Anytime

Item	Code	Price
Mega Rack Power Strip	SP195A	**$189.95**

FloorTrak Cable Covers

Flexible Floor Covers Keep You and Your Cables Safe.

- **Protect pedestrians and cable.**
- **Easy to install.**
- **Blends in with office decor.**

Sometimes you can't avoid running a cable across the floor. But you can avoid dangers to pedestrians *and* to the cable by slipping it into a FloorTrak™ Cable Cover. Each one is pre-slit to make installing the cable easy. Choose from gray or black.

Item	Code	Price
FloorTrak Cable Covers—10-ft. (3-m) (Center Diameter: 0.5" x 0.312")		
Gray	FK213	**$12.95**
Black	FK210	**$12.95**
FloorTrak Cable Covers—5-ft. (1.5-m) (Center Diameter: 0.75" x 0.5")		
Gray	FK313	**$9.95**
Black	FK310	**$9.95**

◆ ◆ ◆

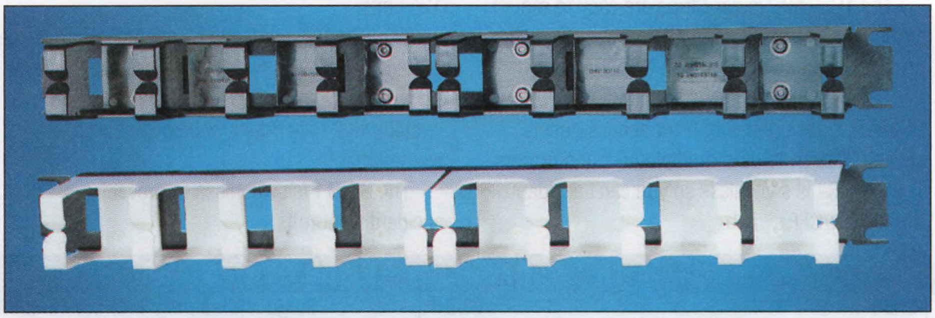
S110 Wire Managers

Bring Your Complicated Cable Runs under Control.

- **Keep related cables together in one conduit.**
- **Made of high-strength, flame-retardant thermoplastic.**
- **Compact 1 RMS (1.75") height.**

Organize your entire wiring closet—no more cable tangles, no uncertainty about which cable belongs to which application, and no more application-threatening snags. The BLACK BOX® S110 Wire Managers offer an ideal cable-management solution for all your connectivity applications.

One S110 Wire Manager fills one rackmount space on a 19" EIA standard relay rack, and can also be wallmounted. Wherever you run your cables, you can keep them organized and out of harm's way. Available in black or white.



FAXBACK INFORMATION
Request Document Number: 14395
Call 412-746-5500 Anytime

Item	Code	Price
S110 Wire Managers, 19"		
Black	JPM040	**$39.95**
White	JPM041	**$39.95**

For our whole line of Racks, see pages 161–169.

◆ ◆ ◆

OPTISOK

Get a Grip! Grab Cables and Pull Them Easily through Conduits.

- **Pull terminated fiberoptic cables, jumpers, and bundles of twisted-pair cable.**
- **Choose from three sizes to pull small to large bundles of cable.**
- **Flexible, non-metallic sleeve expands to grab and pull cables through restricted spaces.**

Ancient mechanical principles make short work of a modern problem. The nylon-sleeve OPTISOK™ features a pull ring on one end. Use it to wrap a bundle of cables below the connectors. Then pull tight. The OPTISOK™ grips the cables firmly. Then you can attach the ring to a pulling line.

SPECIFICATIONS

Maximum Working Load — FT351: 30 lb. (13.6 kg); FT352: 40 lb. (18 kg); FT353: 50 lb. (22.7 kg)

CE Approval — All items listed are approved

Size — FT351: 28" L (71.1 cm); FT352: 31"L (78.7 cm); FT353: 33"L (83.8 cm)

Crimp Tools, **see pp. 156–158.**

Item		Bundle Size		Code	Price
OPTISOK	Small	0.13"–0.8"	(3.2–14.3 cm)	FT351	**$9.95**
	Medium	0.25"–0.8"	(6.4–19.0 cm)	FT352	**$13.95**
	Large	0.75"–1.8"	(19.0–44.5 cm)	FT353	**$19.95**

In This Section...
Hand Tools
Utility Cords
Tool Kits
Connector Kits

Cables Stay Put When You Wrap Them with These Rugged Velcro Cable Wraps.

Velcro Plus Cable Wraps

FT425

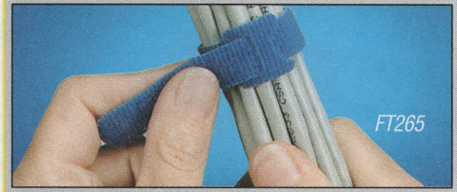
Velcro Plus Cable Wraps (FT420–FT427) feature a reinforced mounting hole and durable cinch buckle to hold cables—tight!

- Nine-inch-long Velcro® Plus Cable Wraps (FT420–FT427) are fully adjustable and reusable. Anchor them to wood, drywall, sheet metal—anywhere you can install a screw!

Item	Code	Price
Velcro Plus Cable Wraps		
9-inch (Pack of 10)		
Black	FT420	**$19.95**
Red	FT422	**$19.95**
Yellow	FT424	**$19.95**
Blue	FT425	**$19.95**
Orange	FT427	**$19.95**

• NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ •

Basic Velcro® Cable Wraps


FT265

- For nonwallmount applications, you need our handy Basic Cable Wraps (FT260–FT267, FT120–FT127) to secure cables quickly.
- Choose the reusable Basic Velcro Cable Wraps to secure and organize large bundles of cables.

FAXBACK INFORMATION
For Velcro® Plus Cable Wraps: 16469,
For Basic Velcro Cable Wraps: 14395,
Call 412-746-5500 Anytime

Item	Code	Was	NOW!
Basic Velcro Cable Wraps			
6-inch (Pack of 10)			
Black	FT260	~~$18.95~~	**$12.95**
White	FT261	~~$18.95~~	**$12.95**
Red	FT262	~~$18.95~~	**$12.95**
Gray	FT263	~~$18.95~~	**$12.95**
Yellow	FT264	~~$18.95~~	**$12.95**
Blue	FT265	~~$18.95~~	**$12.95**
Green	FT266	~~$18.95~~	**$12.95**
Orange	FT267	~~$18.95~~	**$12.95**
12-inch (Pack of 10)			
Black	FT120	~~$28.95~~	**$17.95**
White	FT121	~~$28.95~~	**$17.95**
Red	FT122	~~$28.95~~	**$17.95**
Gray	FT123	~~$28.95~~	**$17.95**
Yellow	FT124	~~$28.95~~	**$17.95**
Blue	FT125	~~$28.95~~	**$17.95**
Green	FT126	~~$28.95~~	**$17.95**
Orange	FT127	~~$28.95~~	**$17.95**

* * *

Cable Markers, Labels, Tags, and Ties

Identify Your Cables Quickly and Easily.

FT931

FT908
FT920
FT930

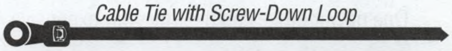
- **Color-coded for easy identification.**
- **Wide labels give you ample space for notes.**

Cable Markers and Color-Coded Cable Labels have enough space for useful wiring notes. Cable Tags help you identify your cables easily. Cable Ties secure the tags on your cable. They're ideal for bundling cable. When ordering, be sure to match the maximum bundle diameter to your requirements.

FAXBACK INFORMATION
Request Document Number: 14395
Call 412-746-5500 Anytime

Cable Tie

Cable Tie with Screw-Down Loop



Item	Code		Price
Cable Markers (Package of 50 Black Markers)	FT930		**$66.95**
Color-Coded Cable Labels (Package of 50, Includes Five Colors)	FT931		**$49.95**
Cable Tags (Package of 100) 0.8-in. (2 cm) Wide			
1.5-in. (3.8-cm) Long	FT920	NEW LOW PRICE! $	**$23.95**
2.0-in. (5.1-cm) Long	FT922		**$25.95**
2.5-in. (6.4-cm) Long	FT924		**$29.95**

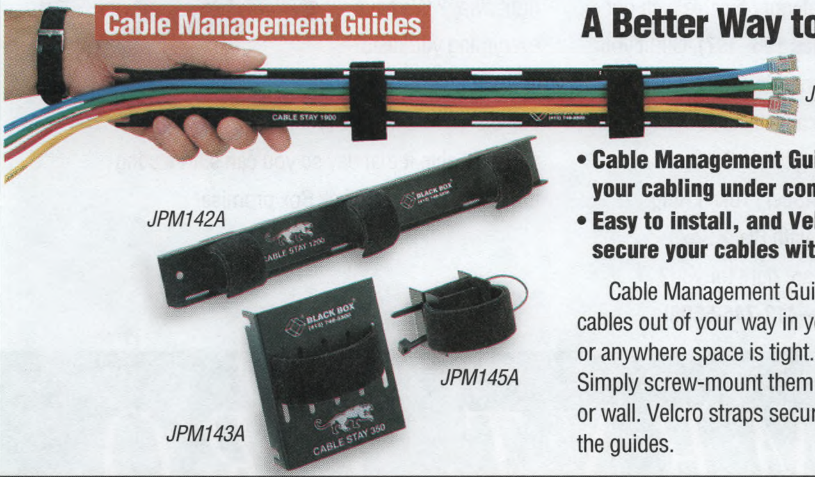
Remember to order your Cable Ties with your Cable Tags:

Item		Max. Bundling Diameter	Length	Code	Price
Cable Ties	Short	0.9-in. (2.3-cm)	4.0-in. (10.2-cm)	FT803	**$7.95**
(Package of 100)	Medium	1.9-in. (4.8-cm)	7.5-in. (19.1-cm)	FT906	**$10.95**
	Long	4.0-in. (10.2-cm)	14.5-in. (36.8-cm)	FT914	**$24.95**
Screw-Down Loop		1.8-in. (4.6-cm)	8.0-in. (20.3-cm)	FT908	**$16.95**

* * *

Cable Management Guides

A Better Way to Manage Your Cabling.



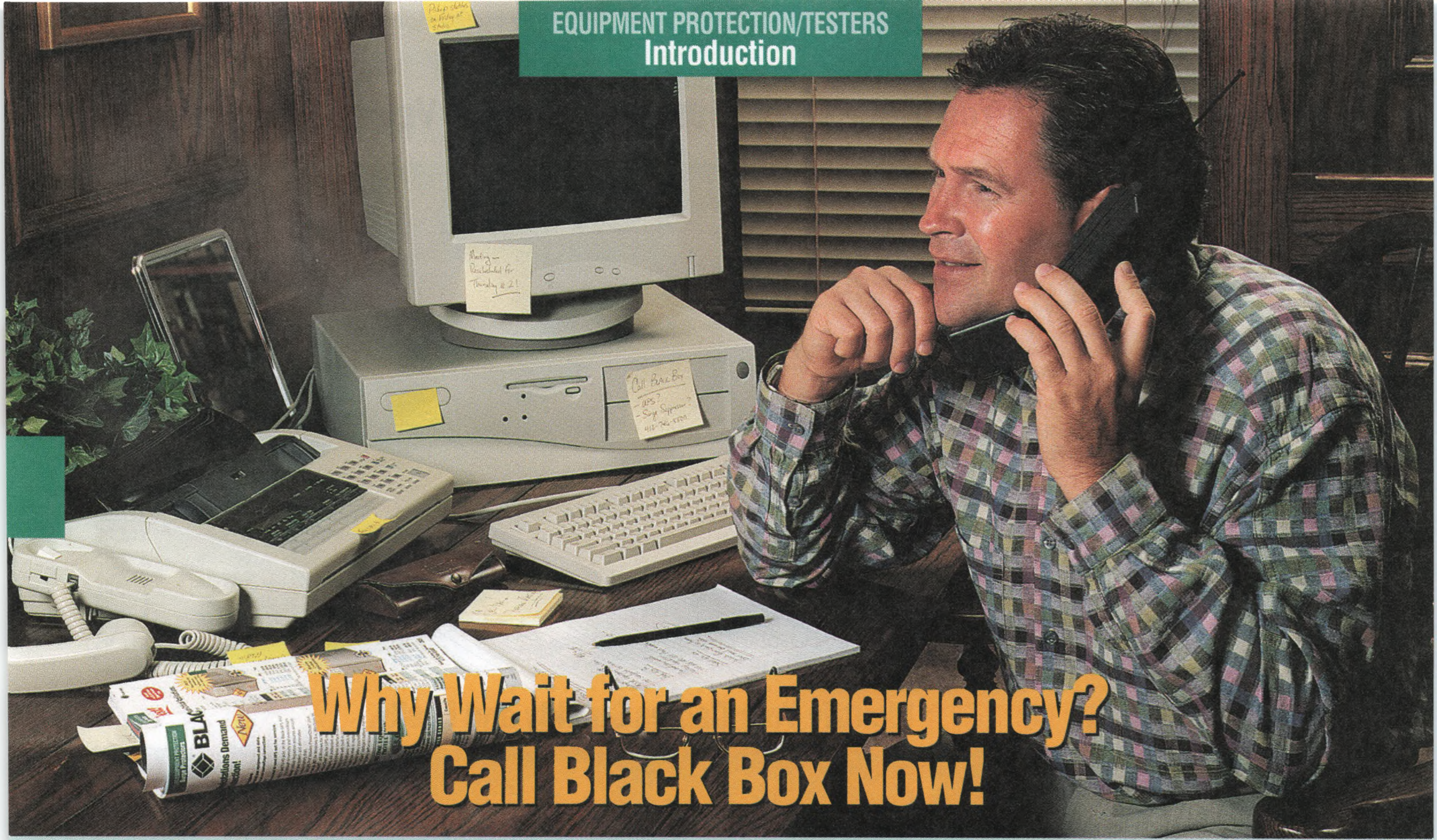
- **Cable Management Guides keep your cabling under control.**
- **Easy to install, and Velcro straps secure your cables within the guides.**

Cable Management Guides keep your cables out of your way in your wiring cabinet or anywhere space is tight. They're easy to install. Simply screw-mount them to a frame, rack, or wall. Velcro straps secure your cables within the guides.

SPECIFICATIONS

Material — 14-gauge CRS steel
Size — JPM145A: 1.5"H x 1.5"W x 1.5"D (3.8 x 3.8 x 3.8 cm);
JPM143A: 3.5"H x 3"W x 1"D (8.9 x 7.6 x 2.5 cm);
JPM142A: 1.3"H x 12"W x 0.8"D (3.3 x 30.5 x 2 cm);
JPM144A: 1.8"H x 19"W x 0.3"D (4.6 x 48.3 x 0.8 cm)

Item		Code	Price
Cable Management Guides (Cable Stays)			
150	(1½-in. Wide)	JPM145A	**$8.95**
350	(3½-in. Wide)	JPM143A	**$10.95**
1200	(12-in. Wide)	JPM142A	**$14.95**
1900	(19-in. Wide)	JPM144A	**$14.95**



Why Wait for an Emergency? Call Black Box Now!

BLACK BOX® + APC = the best!

Protect Your Inve$tment.

One power strike can destroy your expensive electronic equipment. Worse yet—your data could be lost forever. Power protection is a small expense compared to the cost and hassle of replacing *both* your equipment and data.

You can prevent or minimize the damage with some help from Black Box and APC®, maker of the world's most reliable power protection products.

APC high-quality surge protectors and backup power supplies are available from Black Box at *extremely* competitive prices. And they're ready to ship today. Why take chances with the thousands, or hundreds of thousands of dollars you have invested in your equipment?

See **pages 174–182** for our complete APC line and the best power protection you can get.

Smart-UPS® 700 (p. 176)

Doctor Your Network Yourself.

Keep your network healthy. Start with the most critical element—cabling. A problem with *any* part of your cabling can bring your entire network to a screeching halt. So test your cabling before you install it. After installation, troubleshoot and solve problems quickly. Do it all with the help of BLACK BOX® Cable Scanners. Test Category 5 cable with our PentaScanner 350 (**pages 196–197**). Outfit your entire crew with the economical MicroScanner (**page 198**). Run quick cable tests and diagnostics with our Testers and Diagnostic Software (**pages 203–208**). 10BASE-T, Token Ring, Twisted Pair—test it all with Black Box. Not sure which Testers are right for you? **Call our Tech Support—412-746-5500!**

TECH SUPPORT'S PRODUCT OF CHOICE

PentaScanner 350 (pp. 196–197)

Testing? Call Black Box and Ask for BOB, BERT, or SAM.

Need to measure the quality of data-bit transmission, cross interface leads, or monitor lead activity? You'll find the right Breakout Box (BOB), Bit Error Rate Tester (BERT), and Status Activity Monitor (SAM) for the job (**pages 209–215**). You'll even find Data Taps, PockeTesters, and Tester kits.

Not sure which Monitor is right for you? Call our Technical Support Team. They'll ask about your application and suggest the right solution.

Need your Tester right away? We have everything you need—in stock and ready to ship. Call before midnight (ET) and we'll ship it that day so you can start testing tomorrow. That's a Black Box promise!

SAM 232-65 Tri-State (p. 210)

BLACK BOX SOLUTIONS

One-Stop Shopping!

"How do I know how much power protection I need?"

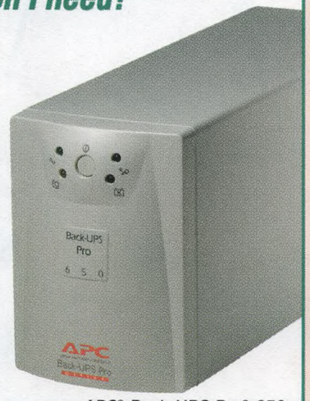
Why waste money with *too much* protection?

Why risk your data and network with *too little* protection?

Step 1. Keep in mind that there are two types of power protection: equipment and data. You can protect equipment with surge protectors and back-up power supplies. Data-line protectors prevent "back-door" power damage via your data cables, telco, LAN, CATV and other lines.

Step 2. Take a look at the Selection Guide **below**. This should lead you to the right protection for your equipment. If you want more guidance, call Tech Support.

Step 3. Give your system a power-protection check-up. Just turn the page for more details on how you can get a **FREE** Power-Protection Evaluation to make sure you're not over- or under-protecting your system.



APC® Back-UPS Pro® 650, p. 175

BUYER'S GUIDE

POWER-PROTECTION SELECTION GUIDE

Application	Product	Pages
Home/Office Equipment: faxes, modems, copiers, TVs, etc.	**Surge Protectors**	183–186
Notebook Computers	**SurgeArrest®**	182
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Small Office: Surge suppression and backup power in one strip.	**Back-UPS® Office™**	178
PC Workstations: Compaq®, Presario, IBM® ValuePoint™, and equivalent PC 386/486 workstations.	**Back-UPS**	175
Advanced Workstations: Pentium®, Power Mac®, Power PC, and 32-bit multi-tasking workstations running Windows® 95, OS/2® Warp, and Windows NT™	**Back-UPS Pro®**	175
Advanced Business Networks: Servers and internetworking devices such as Proliant, IBM® PC servers, HP® NetServers, etc.	**Smart-UPS®**	176–177
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Data Line Protection: Telco, LAN, special applications, and more.	**Data-Line Protectors**	187–192

> **"Since we need to have our computers online overnight to upload files to Ford headquarters, we were concerned with the numerous power failures we'd experienced. Once we installed our new APC Back-UPS, we forgot our problems and now it's a smooth ride. Black Box gave us the best product we could ever use—peace of mind."**
>
> Steve Buddemeyer, Parts Dept. Mgr.
> South Hills Lincoln-Mercury

Updated!

Don't get zapped! Learn how to protect your equipment and data. See p. 635.

FOR *FAST* TECH SUPPORT,
Call **412-746-5500,**

PRESS **1,2,2** CONNECTIVITY
Printer Devices, Cables/Connectors, Switches, Tools/Racks, **Equipment Protection/Testers**

Or if You Prefer:
Fax us at: 412-746-0746.
E-mail us at: info@blackbox.com

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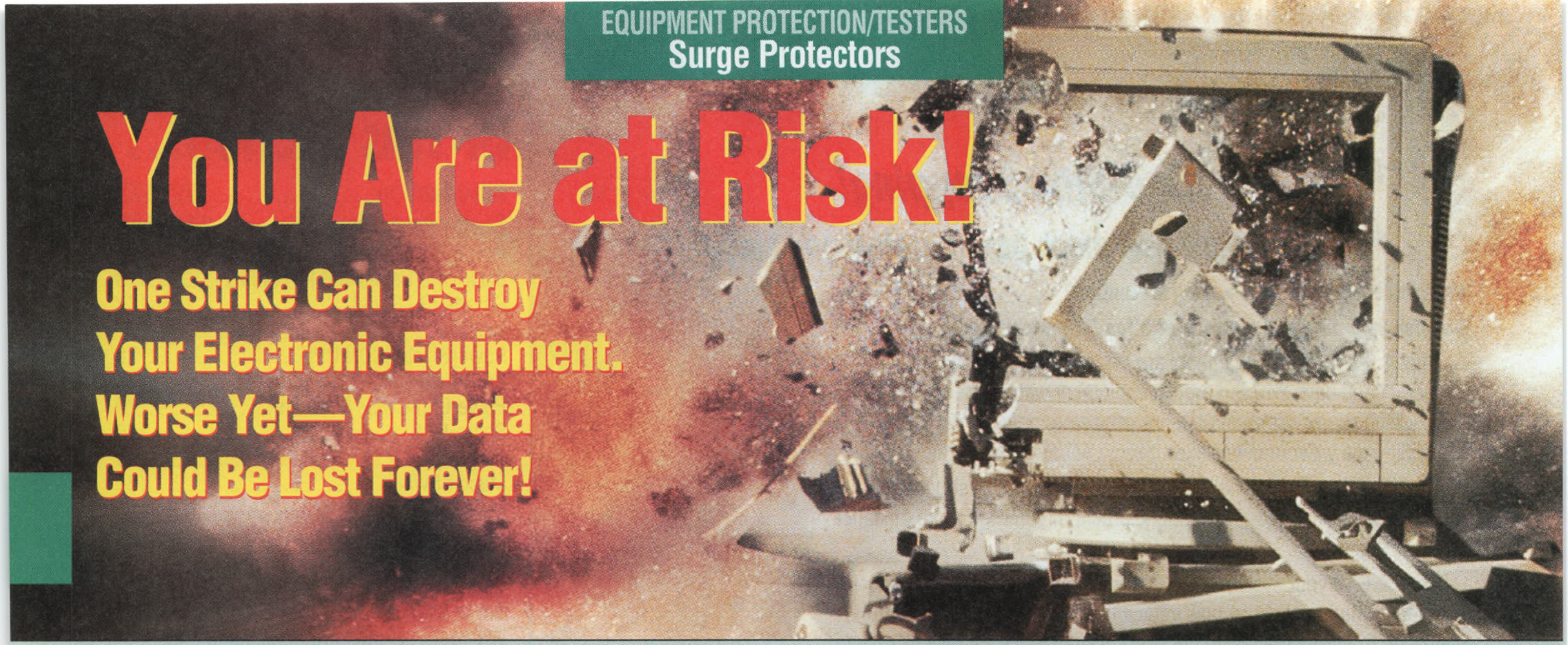
TECTION/TESTERS



You Are at Risk!

One Strike Can Destroy Your Electronic Equipment. Worse Yet—Your Data Could Be Lost Forever!

Power Protection Is a Small Expense Compared to the Cost *and* Hassle of Replacing Equipment and Data!

If power problems account for 48% of data loss, what percentage of your computer budget should you spend on power protection?

Take a look at these examples and see how power protection can save you from replacing your equipment—for a very small investment.

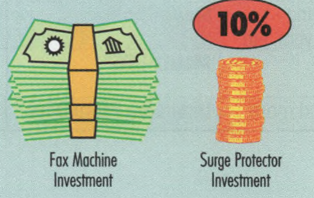
Then give your system a **FREE** Power-Protection Evaluation from Black Box. See **below** for more details.

Example 1...

1. Protect a fax machine with a basic surge protector.

Basic Fax Machine	$359.95*
Black Box Standard Surge Protector	$31.95

For less than 10% of the cost of the fax machine, your equipment is safe. And your business won't be interrupted.

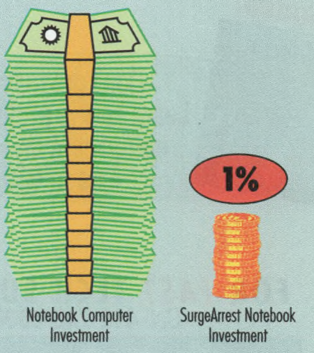


Example 2...

2. Protect a laptop computer with a SurgeArrest Notebook.

Laptop Computer	$2499.00*
SurgeArrest® Notebook	$29.95

Your computer is safe—wherever you go—for little more than 1% of the cost of the computer. That's a sound investment.

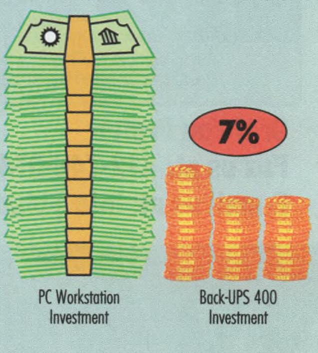


Example 3...

3. Protect your Pentium® type PC—*including* the built-in modem, CD-ROM, external speakers, and monitor—with a Back-UPS 400.

PC Workstation	$2199.00*
Back-UPS® 400	$149.95

Your workstation is fully protected for less than 7% of the cost of your PC. The Back-UPS guards against power surges and supplies enough backup battery power so you can save important files and safely shut down your system.



** Based on advertised prices in the Pittsburgh area (May 1997).*

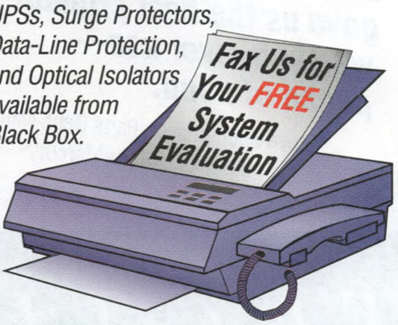
For Your FREE Power-Protection Evaluation...

1. Call the Black Box FaxBack System for your Free Power-Protection Evaluation form.

FAXBACK INFORMATION
Request Document Number: 19187
Call 412-746-5500 Anytime

2. Complete and fax the form to our 24-Hour Fax Line: **800-321-0746**.
3. We'll get back to you within 48 hours with an evaluation of your power-protection needs.

*See **pages 175–195** for the complete selection of UPSs, Surge Protectors, Data-Line Protection, and Optical Isolators available from Black Box.*


Fax Us for Your FREE System Evaluation

BLACK BOX® + APC® = the best!

AMERICAN POWER CONVERSION

Back-UPS and Back-UPS Pro

Shield PCs and High-Performance Workstations from Blackouts and Brownouts.

- Instant battery backup prevents data loss caused by power outages and brownouts.
- Safeguards against lightning and power spikes with full-time surge suppression.
- Hot-swappable, user-replaceable batteries.
- EMI/RFI filters prevent line noise from corrupting data files.
- Provides network-grade surge protection and line conditioning.
- Site-wiring fault indicator identifies potentially dangerous wiring problems.
- Audible battery/low-battery alarm.
- User-replaceable, hot-swappable batteries.
- Back-UPS Pro® includes modem/10BASE-T port surge protection.
- Back-UPS Pro models 280, 420, and 650 include PowerChute® Pro software for unattended shutdowns.

POWER/RUN TIMES

Model	Power	No. of Outlets	Typical Run Times
PS322A	200 VA	2	5 min.
PS323A	250 VA	2	7 min.
PS324A	400 VA	2	5 min.
PS325A	450 VA	4	8 min.
PS326A	600 VA	4	5 min.
PS329A	200 VA	2	5 min.
PS330A	250 VA	4	7 min.
PS331A	400 VA	4	5 min.
PS332A	450 VA	6	8 min.
PS333A	500 VA	6	7 min.

Back-UPS
2 0 0
APC
Back-UPS
Best Value for PCs
Back-UPS Pro
6 5 0
APC
Back-UPS Pro
High-Performance Workstations

Back-UPS 200 (SP322A)

Back-UPS Pro 650 (PS331A)

SPECIFICATIONS

Diagnostics — Back-UPS®: (2) LEDs: UPS on, site-wiring fault; Audible alarms: on battery, low battery, UPS overload;
Back-UPS Pro: Front-panel LEDs: on-line, on-battery, UPS overload, replace battery; Audible alarms: on battery, low battery, UPS overload, replace battery

Indicators — Back-UPS: (2) LEDs: UPS on, site-wiring fault;
Back-UPS Pro: (4) LEDs: on-battery, on-line, replace battery, UPS overload

Surge Capability — Back-UPS: 240 joules, 6500 A, 0 ns, <5 ns typical;
Back-UPS Pro: 320 joules, 0 ns

Interface — DB9 serial port

Power — Primary voltage: 120 VAC, 60 Hz

Size — PS322A–PS324A: 6"H x 3.4"W x 13.1"D (15 x 8.6 x 3.3 cm);
PS325A–PS326A, PS330A–PS331A: 6.6"H x 4.7"W x 14.2"D (16.8 x 11.9 x 36 cm);
PS329A: 5.9"H x 3.4"W x 13.3"D (15 x 8.6 x 33.8 cm);
PS332A–PS333A: 8.5"H x 6.7"W x 17.3"D (21.6 x 17 x 43.9 cm)

Weight — PS322A: 9 lb. (4.1 kg);
PS323A: 10 lb. (4.6 kg);
PS324A: 18 lb. (8.2 kg);
PS325A–PS326A: 25 lb. (11.3 kg);
PS329A: 14.8 lb. (6.7 kg);
PS330A: 17.7 lb. (8 kg);
PS331A: 21.4 lb. (9.7 kg);
PS332A: 42.6 lb (19.3 kg);
PS333A: 47.1 lb. (21.4 kg)

FOR COMPARISON: Back-UPS® SERIES

	Model	Product Code	System Application	Capacity (VA/Watts)
Back-UPS®	200	PS322A	Energy-efficient, "green" PCs.	200/130
	280	PS323A	Network workstations, PCs, POS terminals.	280/180
	400	PS324A	486 network workstations and PCs.	400/250
	450	PS325A	Heavily configured 486 workstations and PCs with peripherals.	450/300
	600	PS326A	Heavily configured network workstations and multimedia systems.	600/400
Back-UPS Pro®	280	PS329A	Pentium®, 486, or other advanced PC systems running Windows® 95 and other major operating systems.	280/180
	420	PS330A	Workstations running Windows 95, Windows for Workgroups™, or Windows NT™; Power Mac®; CAD/CAM applications.	420/280
	650	PS331A	Heavily configured Pentium PCs and advanced systems running Windows 95, Windows for Workgroups, or Windows NT; UNIX® workstations.	650/410
	1000	PS332A	Multiple systems, CAD/CAM/CAE workstations, and longer run-time applications.	1000/670
	1400	PS333A	Multiple systems, LAN hubs, small mini-computers, and telecom equipment.	1400/950

TWO-YEAR 2 FREE WARRANTY

LIFETIME EQUIPMENT PROTECTION

$25,000

FOR AS LONG AS YOU OWN THIS PRODUCT. IF YOUR PROPERLY CONNECTED EQUIPMENT IS EVER DAMAGED BY AN AC SURGE, INCLUDING SURGE DUE TO LIGHTNING, APC WILL REPAIR OR REPLACE OUR PRODUCT AND UP TO $25,000 OF CONNECTED EQUIPMENT FOR AS LONG AS YOU OWN YOUR BACK-UPS OR BACK-UPS PRO. (SEE POLICY FOR DETAILS.)

FAXBACK INFORMATION
Request Document Number: 17202
Call 412-746-5500 Anytime

Item	*APC Part #*	Code	Price
Back-UPS			
200	*BK200B*	PS322A	**$89.95**
280	*BK280B*	PS323A	**$99.95**
400	*BK400B*	PS324A	**$149.95**
450	*BK450*	PS325A	**$175.95**
600	*BK600*	PS326A	**$249.95**
Back-UPS Pro			
280	*BP280BPNP*	PS329A	**$145.95**
420	*BP420BPNP*	PS330A	**$239.95**
650	*BP650BPNP*	PS331A	**$289.95**
1000	*BP1000*	PS332A	**$399.95**
1400	*BP1400*	PS333A	**$539.95**

Other discounts may not apply.

BLACK BOX® + APC = the best!

AMERICAN POWER CONVERSION

Standalone Smart-UPS Series

The Smart Choices for Protecting Mission-Critical Applications.

- Perfect for servers, advanced desktop systems, and networks.
- Shields your equipment from lightning and surges.
- Network-grade line conditioning prevents glitches. Includes full-time EMI/RFI filters.
- Includes the most advanced performance features available and *FREE* PowerChute® *plus* software (on CD-ROM only).
- Intelligent battery management improves reliability and extends battery life.
- Quickswap user-replaceable battery systems enable quick, easy battery replacement on site.

SPECIFICATIONS

Surge Capacity — SP539A–SP540A: 320 joules; SP541A–SP544A: 480 joules

Connectors — DB9 interface port

Indicators — LEDs: On/test, off, overload, SmartTrim, load, on-line, SmartBoost, battery charge/line voltage, on-battery, replace battery

Size — SP539A–SP540A: 6.2"H x 5.4"W x 14.1"D (15.7 x 13.7 x 36 cm);
SP541A–SP542A: 8.5"H x 6.7"W x 17.3"D (21.6 x 17 x 43.9 cm);
SP543A–SP544A: 17"H x 7.7"W x 21.5"D (43.2 x 19.6 x 54.6 cm)

Weight — SP539A–SP540A: 29 lb. (13.2 kg);
SP541A: 43 lb. (19.5 kg); SP542A: 52 lb. (23.6 kg);
SP543A: 112 lb. (51 kg); SP544A: 120 lb. (54.5 kg)

Ask about our $25,000 Lifetime Equipment Protection Policy.

FREE PowerChute® plus Shutdown Software with every Smart-UPS!

SP540A

TWO-YEAR FREE 2 WARRANTY

BUYER'S GUIDE

Smart-UPS® SERIES

Model	Code	Applications (V/W)	Capacity Half/ Full Load (min.)	Typical Run Time	No. of Outlets
450	SP539A	Servers and desktop systems	450/280	18/5	4
700	SP540A	Servers and UNIX® systems	700/450	17/5	4
1000	SP541A	Tower servers and UNIX systems	1000/670	18/6	6
1400	SP542A	Servers, UNIX systems, and multiple servers	1400/950	21/7	6
2200	SP543A	Multiple servers, minicomputers, and UNIX systems	2200/1600	27/9	8
3000	SP544A	Multiple servers, minicomputers, UNIX systems, and phone systems	3000/2250	17/5	8
3000 Battery Pack	BP544	Additional run-time battery pack for SP544A		40/15	

Item	APC Part #	Code	Price
Smart-UPS®			
450	*SU450NET*	SP539A	**$319.95**
700	*SU700NET*	SP540A	**$369.95**
1000	*SU1000NET*	SP541A	**$519.95**
1400	*SU1400NET*	SP542A	**$639.95**
2200	*SU2200NET*	SP543A	**$1119.95**
3000	*SU3000NET*	SP544A	**$1739.95**
3000 Battery Pack		BP544	**$389.00**

Other discounts may not apply.

Extra Run-Time Smart-UPS Series

- Add extra run time (up to 100 hours) to your mission-critical applications.
- Shields your equipment from lightning and surges.
- Expandable, extended-run power protection for maximum uptime applications.
- The smart solution for surviving a protracted power outage.
- Swap batteries quickly.

SPECIFICATIONS

Surge Capacity — 480 joules

Connectors — DB9 interface port

Indicators — LEDs: On/test, off, overload, SmartTrim, load, on-line, SmartBoost, battery charge/line voltage, on-battery, replace battery

Size — SP550A–SP551A: 8.5"H x 6.7"W x 17.3"D (21.6 x 17 x 43.9 cm);
SP552A: 17"H x 7.7"W x 21.5"D (43.2 x 19.6 x 54.6 cm);
BP551–BP552: 8.5" x 6.7" x 17.3" (21.6 x 17 x 43.9 cm)

Weight — SP550A: 52 lb. (23.6 kg);
SP551A: 56 lb. (25.4 kg);
SP552A: 120 lb. (54.5 kg);
BP551–BP552: 69 lb. (36.1 kg)

Mission-Critical Applications

SP551A

TWO-YEAR FREE 2 WARRANTY

BUYER'S GUIDE

EXTRA RUN-TIME Smart-UPS SERIES

Model	Code	Applications (V/W)	Capacity Half/ Full Load (min.)	Typical Run Time	No. of Outlets
700XL	SP550A	Telecom and other extended-run-time applications	700/450	42/12	6
1000XL	SP551A	Telecom and other extended-run-time applications	1000/670	24/6	6
700XL/1000XL Battery Pack	BP551	Additional run time for SP551A		90/40 approx./pk	
2200XL	SP552A	Telecom and other extended-run-time applications	2200/1600	24/7	8
2200XL Battery Pack	BP552	Additional run time for SP552A		42/18	

Item	APC Part #	Code	Price
Extra Run-Time Smart-UPS® Series			
700 XL	*SU700XLNET*	SP550A	**$569.95**
1000 XL	*SU1000XLNET*	SP551A	**$619.95**
2200 XL	*SU2200XLNET*	SP552A	**$1269.95**
Battery Packs			
700XL/1000XL	*SU24XLBP*	BP551	**$329.00**
2200 XL	*SU48XLBP*	BP552	**$389.00**

Other discounts may not apply.

In This Section...
Surge Protectors
Line Conditioners
Data-Line Protection
Optical Isolation

Rackmountable Smart-UPS Series

The Smart Choice for Economical Rackmount Protection.

APC®
AMERICAN POWER CONVERSION

- Powerful enough to protect and run your server.
- Shields your equipment from lightning and surges.
- Slim-line design adds reliability to servers, hubs, PBXs, and other rackmountable peripherals.
- Easily mounts with screws on standard 19" racks.
- Choose six- or eight-outlet models for maximum space efficiency.

FAXBACK INFORMATION
For All Smart-UPS® Products: 17226
Call 412-746-5500 Anytime

SPECIFICATIONS

Surge Capacity — SP545A: 320 joules; SP546A–SP549A: 420 joules
Connectors — DB9 interface port
Indicators — LEDs: On/test, off, overload, SmartTrim, load, on-line, SmartBoost, battery charge/line voltage, on-battery, replace battery
Size — SP545A–SP547A: 5.2"H x 19"W x 15"D (13.3 x 48.3 x 38.1 cm);
SU2200RM3U, SU3000RM3U: 5.25"H x 19"W x 20"D (13.3 x 48.3 x 50.8 cm)
Weight — SP545A: 40 lb. (18.1 kg);
SP546A: 46 lb. (21 kg);
SP547A: 55 lb. (25 kg);
SU2200RM3U: 120 lb. (54.5 kg);
SU3000RM3U: 129 lb. (58.6 kg)

TWO-YEAR FREE 2 WARRANTY

The Solution for Rackmount Equipment

PLUS! Racks and Cabinets, **see pp. 161–169.**

BUYER'S GUIDE

RACKMOUNTABLE Smart-UPS® SERIES

Model	Code	Applications (V/W)	Capacity Half/ Full Load (min.)	Typical Run Time	No. of Outlets
700RM	SP545A	Hubs, PBXs, and other rackmount equipment	700/450	17/5	6
1000RM	SP546A	Hubs, PBXs, and other rackmount equipment	1000/670	18/6	6
1400RM	SP547A	Hubs, PBXs, and other rackmount equipment	1400/950	11/6	6
2200RM	SU2200RM3U	Hubs, PBXs, and other rackmount equipment	2200/1600	24/9	8
3000RM	SU3000RM3U	Hubs, PBXs, and other rackmount equipment	3000/2250	17/5	8

Item	APC Part #	Code	Price
Smart-UPS® RM			
700RM	SU700RMNET	SP545A	**$459.95**
1000RM	SU1000RMNET	SP546A	**$599.95**
1400RM	SU1400RMNET	SP547A	**$759.95**
2200RM		SU2200RM3U	**$1299.95**
3000RM		SU3000RM3U	**$1999.95**

Other discounts may not apply.

NetRack

At Last—A Cabinet that's Ready to Use! No Assembly Required.

- **Fully assembled. Ready to use right out of the box.**
- **Sturdy, heavy-gauge steel construction holds whatever you can load in it.**
- **Locking front and rear doors provide extra security.**
- **Front door can open from left or right with quick-change pins.**
- **No guesswork! Includes two shelves, removable top and side panels, and doors.**
- **Extra deep and wide cabinet gives you lots of built-in space for cabling.**

You're a networking expert—not an assembler. Make life easier with our fully assembled, modular NetRack. It's loaded with all the features networking professionals want: security, easy access to equipment and cabling, and modular construction for expansion.

For more details, see **page 167.**

FAXBACK INFORMATION
Request Document Number: 18636
Call 412-746-5500 Anytime

EXCLUSIVE

New

SPECIFICATIONS

Material — 12-gauge steel
Size — 78"H x 19"W x 30"D (198 x 48.3 x 76 cm)
Weight — 275 lb. (124.7 kg)

Item	Code	Price
NetRack (Includes 2 Shelves) 78" x 19" x 30"		
Black	RM500A	**$1195.95**
Beige	RM505A	**$1195.95**
Top Fan Panel		
Black	RM501	**$169.95**
Beige	RM506	**$169.95**
Bottom-Mount Tower Shelves (2 Shelves)		
Black	RM502	**$199.95**
Beige	RM507	**$199.95**
Caster Base		
Black	RM503	**$179.95**
Beige	RM508	**$179.95**

MORE! Rackmount Surge Protectors, **see p. 185.**

BLACK BOX® +

TWO-YEAR 2 FREE WARRANTY
New
PowerShield ISDN 10W
Uninterruptible Power Supply
APC
AMERICAN POWER CONVERSION
Test / Alarm Disable
Battery
On/ Off
DC Output

PowerShield ISDN

Here's the First UPS and Surge Protector Designed Just for ISDN Equipment.

- **Keep your ISDN line—and your business—up and running during power outages.**
- **Backup battery power keeps your ISDN line going for 1 to 5 hours—up to 15 hours with the Extended-Run Pack.**
- **Works with both the U or ST ISDN interface.**
- **Battery self-tests to ensure your system will be ready in a power failure.**
- **Audible and visual indicators so you can monitor changes in power conditions.**

Your ISDN line is just as susceptible to power surges, brownouts, and blackouts as is your computer. ISDN service is different from normal telephone service—although telephones draw their power directly from the phone line, ISDN service requires a separate power drawn from the utility line. In fact, some states won't allow 911 service over ISDN lines because of the problem with power outages.

PowerShield ISDN eliminates the risk of losing your ISDN service during a power outage. It provides the power necessary to run your ISDN service and keep your business moving.

The PowerShield ISDN replaces the AC adapter supplied with an ISDN NT-1 unit. It provides, on average, four hours of backup power for your ISDN service. Use the optional Extended-Run Battery Pack to triple this run time.

And the PowerShield ISDN also protects your ISDN equipment from power surges and spikes on the AC line.

SPECIFICATIONS

Power — 115 VAC, 60 Hz
Size — 2.5"H x 6"W x 6.3"D (6.4 x 15.2 x 16 cm)
Weight — PowerShield ISDN: 3.5 lb. (1.6 kg); Extended-Run Battery Pack: 5 lb. (2.3 kg)

FAXBACK INFORMATION
Request Document Number: 19053
Call 412-746-5500 Anytime

BUYER'S GUIDE

PowerShield™ ISDN 10W

Application	Load	Typical PowerShield Run Times		Output
		Power Shield	w/Extended-Run Battery Pack	
Voice and Data ISDN Communications Backup Power and Surge Protection.	2 watts	5 hours	15 hours	-48 VDC
	4 watts	3 hours	10 hours	-48 VDC
	10 watts	1 hour	3 hours	-48 VDC

Item	Code	Price
PowerShield ISDN 10W UPS	DMISDN410	**$149.00**
PowerShield ISDN Extended-Run Battery Pack	DMISDNXBP	**$99.00**

All the cables you need are included.

◆ ◆ ◆

Back-UPS Office

Get Full-Time Surge Suppression *and* Backup Power—in One Small Strip!

- Protects up to six connected PCs, printers, modems, etc. against surges and spikes.
- Provides backup battery power for three connected devices, monitors, CPUs, etc.
- Get Internet-ready fax/modem protection.
- Compact design installs easily on desktop, floors, or mounts to the wall.

MORE! Back-UPS® Office™ Information, **see p. 58.**

Item	Code	Price
Back-UPS® Office™	SP800A	**$169.95**

All the cables you need are included.

Power Cruise Solution Pak Includes:
The Back-UPS Office **plus** (**1**) Sportster 56K External Modem (001786)

Item	Code	Price
	BD1050A	**$419.90**

For more details, see p. 50.

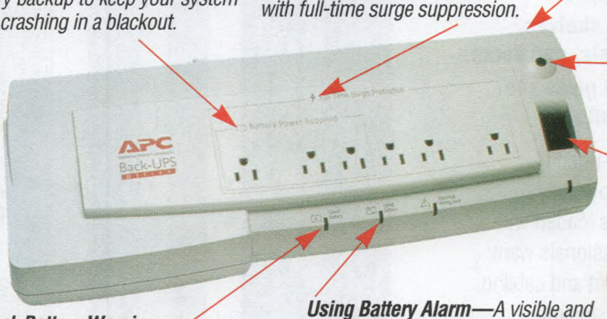
UPS Power—*Three outlets provide instantaneous battery backup to keep your system from crashing in a blackout.*

Surge Suppression—*Six outlets guard your hardware with full-time surge suppression.*

Fax/Modem Protection—*Protect your phone line or network connection via built-in RJ-11 and RJ-45 jacks.*

Circuit Breaker—*Provides protection in the event of an overload or a short circuit.*

Recessed Master On/Off Switch—*Prevents accidental power-off.*



Check Battery Warning—*An LED lights when the battery is weak, giving you 6–8 weeks of warning.*

Using Battery Alarm—*A visible and audible alarm alerts you when equipment is running on battery power.*

PRODUCTIVITY SOLUTION PAK NEW WAYS TO WORK! AVAILABLE! See page 50.

FAXBACK INFORMATION
Request Document Number: 17202
Call 412-746-5500 Anytime

APC® = the best!

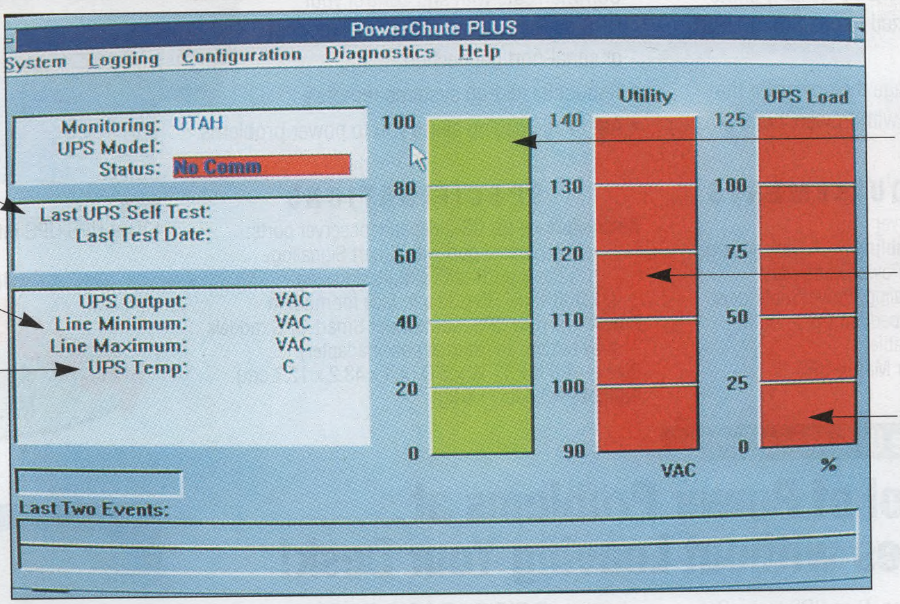
AMERICAN POWER CONVERSION

PowerChute *plus* Software

Crisis Planning—It's Working Smarter.

Here's the Black Box Solution for Advanced Power Management and Diagnostics.

The Perfect Mate for Smart-UPS® and Back-UPS®!



Monitoring: UTAH
UPS Model:
Status: No Comm

Last UPS Self Test:
Last Test Date:

UPS Output: VAC
Line Minimum: VAC
Line Maximum: VAC
UPS Temp: C

Last Two Events:

UPS Self-Test—*Unattended scheduled self-tests warn of faulty UPS or weak battery.*

Min./Max. Power-Line Voltage—*Useful in determining power quality.*

UPS Temperature—*Monitoring for proper UPS temperature to extend battery life.*

Battery Run Time—*See how many minutes of battery time are left for system use and outages.*

Utility-Line Voltage—*Check this power-quality display for fast diagnosis of problems.*

UPS Load Capacity—*Find out the percentage of the UPS load and if the UPS is sized correctly.*

Realtime Graphical Display of UPS/Power Status—*Check important data, such as UPS operation, power-line status, and environmental conditions from your PC.*

APC
POWERCHUTE plus
User's Guide

- **Run PowerChute *plus* with all APC® Smart-UPS and APC Back-UPS (pp. 175–177).**
- **A real plus for network administrators! Use the software to manage and diagnose UPS parameters and configure the UPS's reaction to power events.**
- **PowerChute *plus* gives you extensive unattended system shutdown.**
- **Test and check the UPS status. Automatically monitors the health of your UPS and battery.**
- **Manage your UPS remotely.**

Enhance your UPS performance significantly with PowerChute® *plus* software. With this UPS power management and diagnostic software, you get the security of knowing your network file server will shut down safely should a power failure occur.

Use PowerChute *plus* with our Back-UPS® for extensive unattended system shutdown capability. Use it with our Smart-UPS® backup for unattended system shutdown and unsurpassed UPS power management and diagnostic features.

Network administrators will get more useful information about the UPS and greater flexibility in configuring the UPS's reaction to power events. The software gives you UPS testing/status information, remote UPS management, and environmental/power monitoring.

With PowerChute *plus,* you can customize your UPS to your needs. Set the following 11 parameters in permanent memory:

- UPS ID
- Sensitivity
- Self-test
- Shutdown delay
- Output voltage
- Minimum-battery capacity
- Low transfer
- High transfer
- Alarm
- Return delay
- Low-battery capacity

System compatibility is no problem either. PowerChute *plus* is tested and certified by operating system vendors for systems such as Novell® NetWare®, IBM® OS/2®, LANServer, SunSoft® Solaris®, and Microsoft® Windows®.

PowerChute *plus* includes:

- Operations manual
- 3½" diskettes
- Cables and adapters for connecting the UPS to the fileserver or workstation

PLUS! Back-UPS® and Smart-UPS®, **see pp. 175–177.**

FAXBACK INFORMATION
Request Document Number: 17202
Call 412-746-5500 Anytime

Item	APC Part #	Code	Price
PowerChute® *plus* Software			
Novell	AP9003	LS780V	**$69.95**
UNIX®	AP9004	LS781V	**$99.95**
Windows 95	AP9007	LS782V	**$49.95**
Windows NT™	AP9009	LS783V	**$69.95**
HP-UX®	AP9005	LS784V	**$139.95**

Other discounts may not apply.

FAXBACK INFORMATION
For All Products on This Page: 19022
Call 412-746-5500 Anytime

BLACK BOX® +

Enhanced Power Protection with UPS Accessories.

Share-UPS UPS Interface Expander

Connect up to 8 Servers to a Single UPS!

- When power fails, Share-UPS® reliably shuts down 8 servers connected to one Smart-UPS® or one Matrix-UPS®.
- Use one server to manage the power for the other servers. Just use with PowerChute® *plus* or with SNMP.
- Communicate with and control your UPS remotely using an external modem or serial-port connection.
- Reboot locked-up systems remotely.
- Automatic paging alerts you to power problems.

Share-UPS
APC
New

SYSTEM REQUIREMENTS

Safe System — (1) Per server
Shutdown Software and Cabling — Advanced port: Smart signaling with PowerChute *plus*; Basic ports: Simple signaling, PowerChute *plus* recommended, or embedded OS shutdown/signaling cable
UPS — APC® Smart-UPS or Matrix-UPS

SPECIFICATIONS

Connectors — (8) OS-independent server ports:
(1) Advanced port with Smart Signaling,
(7) Basic ports with simple signaling;
(1) DB9 serial RS-232 interface for modem
Power — From UPS (some older Smart-UPS models may require an external power adapter)
Size — 1.8"H x 17"W x 5"D (4.4 x 43.2 x 12.7 cm)
Weight — 3.5 lb. (1.6 kg)

Item	Code	Price
Share-UPS UPS Interface Expander, Desktop	AP9207	**$349.00**

All the cables you need are included.

PLUS! Smart-UPS, **see p. 176.** Matrix-UPS, **see p. 181.**

Call-UPS *II* Remote UPS Management

Take Control of Power Problems at Remote Sites without Leaving Your Desk!

- Reboot locked-up devices. Run UPS tests. Get complete UPS power information, troubleshoot, and change UPS parameters easily—and remotely—via a modem or serial link.
- Automatic dialing to two pagers alerts you to problems.
- System/security features protect access to your system.

SPECIFICATIONS

System Requirements — Modem: 1200-bps minimum; UPS: APC Smart-UPS or Matrix-UPS
Connectors — DB9 serial RS-232
Power — From UPS (some older Smart-UPS models may require an external power adapter)
Size — 1.3"H x 4.3"W x 4.5"D (3.4 x 10.8 x 11.4 cm)
Weight — 1 lb. (0.5 kg)

NOTE: Call-UPS II can share a single phone line with an existing computer/modem, but requires a user-supplied, dedicated modem.

New
APC
AMERICAN POWER CONVERSION
Call-UPS II
Remote UPS Management Device

Item	Code	Price
Call-UPS *II* Remote UPS Management, Desktop	AP9208	**$179.00**

All the cables you need are included.

MasterSwitch Control Local and Remote Network Power via the Web.

- Here's the first power-switching device with embedded Web management. Or use SNMP management.
- Control the power for up to eight devices from across the hall or across the country. A serial interface enables remote management.
- Sequence power startups and shutdowns outlet by outlet.
- Remotely reboot locked-up devices.
- A built-in Ethernet interface gives you direct LAN connections.
- Use MasterSwitch with or without a UPS.
- Front-panel LEDs provide quick status checks of power loads.

SPECIFICATIONS

Connectors — (8) NEMA 5–15 outlets;
(1) DB9 serial RS-232 interface for modem;
(1) RJ-45 for 10BASE-T
Power — 115 VAC, 60 Hz, 15-ft. attached cord; 15-A resettable circuit breaker
Size — 1.9"H x 17"W x 6.5"D (5.4 x 43.2 x 16.5 cm)
Weight — 6.5 lb. (3 kg)

Item	Code	Price
MasterSwitch	AP9210	**$699.00**

All the cables you need are included.

APC® = the best!

AMERICAN POWER CONVERSION

Matrix-UPS

Hot-Swappable Modular Design Means 100% Uptime.

- Super reliability—any failure is limited to its module.
- Line-interactive design delivers zero-transfer time with computer loads and deep brownout protection.
- Full environmental monitoring—you're alerted when ambient conditions go out-of-bounds.
- Get full line-conditioning and multi-stage surge protection.

SPECIFICATIONS

Indicators — User display: Programmable 2 x 16 character backlit LCD, 4 languages

Power — Input: 208/230 VAC, 50/60 Hz; Output: 120/208/240 VAC

Size — All: Electronics and Isolation modules mated: 17.8"H x 13.8"W x 17.8"D (45.2 x 35.1 x 45.2 cm); SmartCell: 9.1"H x 6.9"W x 17.8"D (23.1 x 17.5 x 45.2 cm); SmartCell XR: 17.8"H x 13.8"W x 7.8"D (45.2 x 35.1 x 45.2 cm)

Weight — All: Electronics and Isolation modules mated: 144 lb. (65.3 kg); SmartCell: 64 lb. (29 kg); SmartCell XR: 302 lb. (136.9 kg)

Data Centers and Mission-Critical Servers

New
$25,000 Lifetime Equipment Protction

SmartCell™ module is the battery pack. You can swap SmartCells out and add more for additional capacity. Includes a "Replace SmartCell" LED.

Electronics Module includes main processor.

Isolation Module enables multiple output voltages in bypass mode.

Matrix 5000 XR

No downtime! Modular design means you can hot-swap modules without interrupting power to the loads.

FAXBACK INFORMATION
Request Document Number: 18162
Call 412-746-5500 Anytime

Item	APC Part #	Code	Price
Matrix-UPS® 3000	MX3000	SP560A	**$2999.00**
Matrix-UPS 3000 XR (Extended Run)	MX3000XR	SP561A	**$3499.00**
Matrix-UPS 5000	MX5000	SP562A	**$4229.00**
Matrix-UPS 5000 XR (Extended Run)	MX5000XR	SP563A	**$4359.00**
Extra Battery Pack		SMARTCELL	**$599.00**
Extra Battery Pack XR		SMARTCELLXR	**$1399.00**
PowerChute® *plus* Software			**See page 179.**

All the cables you need are included.

Matrix-UPS APPLICATIONS	
Matrix 3000 **Matrix 5000**	Multiple file servers, midrange systems including AS/400®, VAX™, and HP®, wiring closets and other application with total loads above 2000 VA.
Matrix 3000 Extended Run **Matrix 5000 Extended Run**	Telecom equipment and data centers requiring extended run time. 5000 VA/3750 W

Matrix-UPS				
Model	**Matrix 3000**	**Matrix 3000 XR**	**Matrix 5000**	**Matrix 5000 XR**
Power Capacity	3000 VA/2250 W		5000 VA/3750 W	
No. of SmartCell Battery Packs	1	2*	1	2*
Run Time (Full/Half Load)	7/18 min.	28/72 min.	8/20 min.	32/80 min.
Recharge Time	1.2 hrs.	3.8 hrs.	2.7 hrs.	8.1 hrs.
Intelligent Bypass	Automatic upon failure or user-switchable			
Intelligent Serial Interface	✓			
SNMP Capability	via SNMP Adapter			
Multiple Server/Operating System Shutdown	via Share-UPS			
Modem Control	via Call-UPS			
Computer/Network Interface	OS/2®, AS/400, VAX, Novell®, UNIX®, LAN Manager, etc.			
Receptacles (Number/Type)	(1) L14-30R, (2) L6-30R, (6) 5-15R			

*Matrix 3000 XR and Matrix 5000 XR include extended-run SmartCell XR Battery Packs.

◆ ◆ ◆

SmartSlot Accessories Customize Your Smart-UPS or Matrix-UPS for Easier Power Management.

These new SmartSlot™ UPS accessories give you complete control of your UPS. They plug directly into your SmartSlot equipped APC® UPS and become an integral part of the unit.

Easy Installation—With the **SmartSlot Expansion Chassis**, you can add SmartSlot accessories to your Smart-UPS or Matrix-UPS, even if it isn't equipped with a SmartSlot.

Use SmartSlot Accessories for:

Systems Management—With the **SmartSlot UPS Interface Expander**, you can protect three servers with a single UPS. (See **page 180** for more details on the Share-UPS™ UPS Interface Expander.)

You can also use the **SmartSlot SNMP 10BASE-T Adapter** to connect your Smart-UPS® or Matrix-UPS to an SNMP-managed Ethernet network.

For specifications, request the FaxBack.

Environmental Monitoring and Control—Monitor temperature and/or humidity with **Measure-UPS *II***.

Communications—With **Call-UPS *II***, you can manage your UPS via modem, even if the network is down. (See **page 180** for more Call-UPS® details.)

The **SmartSlot Relay I/O Module** offers basic UPS control and monitoring of critical alarms through a generic dry-contact interface.

Item	Code	Price
SmartSlot UPS Accessories		
Expansion Chassis	AP9600	**$74.95**
10BASE-T SNMP Adapter	AP9605	**$399.95**
Smart-UPS Interface Expander	AP9607	**$149.95**
Measure-UPS® *II*		
Temperature	AP9612T	**$149.95**
Temperature/Humidity	AP9612TH	**$199.95**
Call-UPS *II*	AP9608	**$159.95**
Relay I/O Module	AP9610	**$179.95**

All the cables you need are included.

New

*Customize your UPS with SmartSlot accessories. They just slide right in and become an integral part of your UPS. Right: Smart-UPS UPS Interface Expander (AP9607) and the Smart-UPS 1000 (SP541A, see **p. 176**).*

FAXBACK INFORMATION
Request Document Number: 19039
Call 412-746-5500 Anytime

BLACK BOX + APC = *the best!*

ProtectNet

Protect Data Lines from “Back-Door” Surges!

- **Protect telephone lines from transients conducted directly from outdoor power lines.**
- **Stop surge voltages from nearby lightning strikes and electrostatic discharge from racing through your data lines.**

Prevent unexplained “back-door” damage from non-AC line surges. Guard against burnt or damaged motherboards, modem/fax cards, and network interface cards, hubs, routers, concentrators, etc.

PTEL2—For Two Telephone Lines

- Protects telephone lines, modems, fax and answering machines.
- Accommodates both standard RJ-11 and RJ-45 telephone jacks.
- Virtually maintenance-free with a self-resetting fuse.
- Don’t forget about internal modems and laptops—surges traveling along serial and modem lines will crash right into your CPU. Stop them cold with the PTEL2.

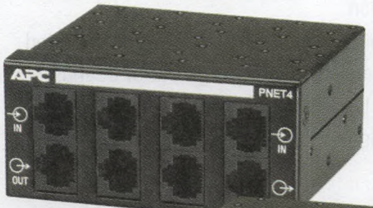
PNET4—For 4–40 Pieces of Network Equipment

- For 10BASE-T or Token Ring networks using unshielded twisted-pair cable with RJ-45 connectors.
- Protect up to 4 hubs, routers, concentrators,* and other networking equipment per unit.
- Stack or rack ’em to protect up to 40 lines. Rack- and wallmount equipment is included.

PTEL1-4—For 4–40 Telephone Lines

- Protect up to 4 telephone lines, modems, fax and answering machines per unit.
- Stack or rack ’em to protect up to 40 two-wire phone/modem lines. Rack- and wallmount equipment is included.

PTEL2



PNET4

PTEL1-4

F A X B A C K I N F O R M A T I O N
Request Document Number: 19046
Call 412-746-5500 Anytime

BUYER'S GUIDE

ProtectNet™

Model	Applications	Lines Protected (Connector)	Peak Voltage*	Breakover Voltage (Nominal)	Includes
PTEL2	2-line protector for telephones, modems, fax, and answering machines (RJ-11/RJ-45 type)	4 & 5, 3, & 6 on RJ-11/45 connector	±6000V	260 V peak	6-ft. cable, mounting fasteners
PNET4	Protects (4) input lines for 10BASE-T or Token Ring	1–8 on RJ-45	±6000V	8 V peak	Ground cable, patch cable, wallmount brackets
PTEL1-4	Protects (4) single-line (2-wire) input lines for telephones, modems, and faxes	4 & 5 on RJ-45/11	±6000V	260 V peak	Ground cable, wallmount brackets

*1.2/50 us test waveform.

ProtectNet™ features a unique **“Double Up!”** Supplemental Equipment Protection Policy, under which the total recoverable limits of another APC® AC product’s Lifetime Equipment Protection policy is doubled! APC will then repair or replace properly connected and protected equipment in the unlikely event that it is damaged by a lightning strike or surge, up to $50,000!* (U.S. and Canada only.)

* See policy for details.

Item	Code	Price
ProtectNet		
2-Line Telephone	PTEL2	**$39.95**
4-Line 10BASE-T/Token Ring	PNET4	**$99.95**
4-Line Telephone	PTEL1-4	**$89.95**

All the cables you need are included.

◆ ◆ ◆

SurgeArrest Notebook

Protect Your Notebook from AC- and Telephone-Line Surge Damage.

PNOTE1

SurgeArrest protects both your AC- and phone-line connections from damaging surges—guaranteed!

- Stops damaging power surges and spikes from racing through your AC line and destroying your notebook computer.
- Protects your phone connection from destructive surges that can damage your notebook and data.
- Easy to use. Just plug your phone and notebook connections into SurgeArrest®. Then plug it into the wall socket.
- A “protection-working” indicator tells you SurgeArrest is working.

3-YEAR EQUIPMENT PROTECTION
$3,500
(SEE POLICY FOR DETAILS.)

F A X B A C K I N F O R M A T I O N
Request Document Number: 19060
Call 412-746-5500 Anytime

Item	Code	Price
SurgeArrest Notebook	PNOTE1	**$29.95**

Surge Soldier • Surge Soldier Plus

Ever-Vigilant Surge Soldiers at Super Low Prices!

Halt Deadly Power Surges before They *Attack* Your Equipment.

- **Indicator lights signal your equipment is being fully protected.**
- **Full-line diagnostics warn you of possible problems.**
- **Includes a heavy-duty, grounded 14/3 SJT power cord.**
- **Protect your equipment from surges as high as 30,000 or 40,000 volts, depending on the model.**
- **Protect up to eight pieces of equipment.**

Your first line of defense against destructive electrical surges starts right at the socket with the BLACK BOX® Surge Soldier and Surge Soldier Plus. Count on these reliable guards to protect your equipment day-in, day-out from the ravages of electrical surges and spikes.

The Surge Soldiers feature state-of-the-art surge and noise suppression technology—including a fail-safe, catastrophic surge fuse.

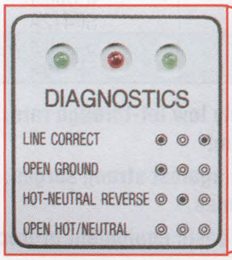
The Surge Soldier will protect your computer and other sensitive electronic equipment from power surges as high as 30,000 volts.

The Surge Soldier Plus, with multi-stage, hybrid surge and noise suppression technology, protects your equipment from power surges as high as 40,000 volts. The super-reliable Soldier Plus actually follows the electrical sine wave and instantaneously clamps surges at a safe 30 volts above the sine wave.

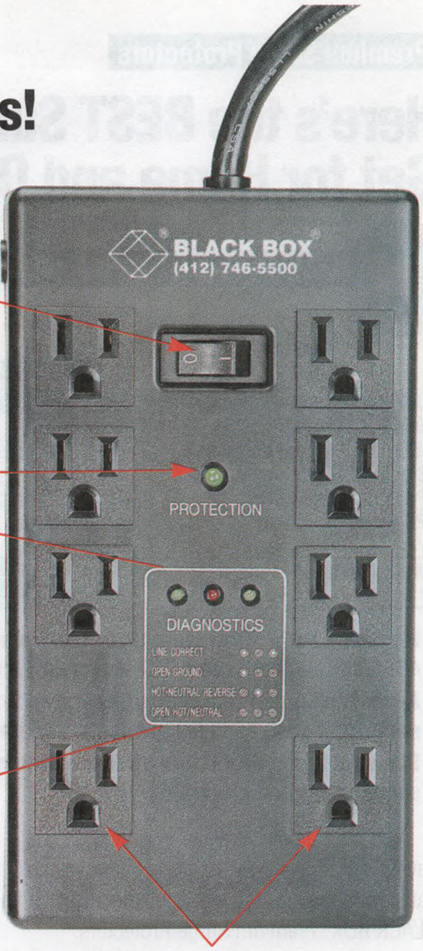
Don't forget to protect your phone, fax, and modem lines, too. Both the Surge Soldier and Surge Soldier Plus are available with RJ-11 ports to guard your telco data lines as well.

Master On-Off switch controls power to all eight receptacles.

LED indicates surge protection is working properly and fully protecting your equipment.

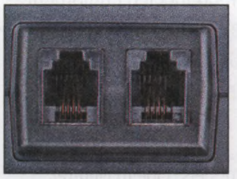


Complete site wiring diagnostics: Immediately alerts you if your wall outlet is not wired properly.



Two "spaced" receptacles accommodate transformers.

MORE! Surge Protectors, see pp. 184–186.



Protect phone, fax, and modem lines, too, with specially equipped Surge Soldiers listed at right.

FAXBACK INFORMATION
Request Document Number: 16115
Call 412-746-5500 Anytime

SPECIFICATIONS

Clamping Level — SP460A–SP461A: 130; SP462A–SP463A: 165; SP464A–SP467A: 130

EMI/RFI Filtration — SP460A–SP463A: Up to 65 dB; SP464A–SP467A: Up to 90 dB

Joules Rating — SP460A–SP463A: 2000; SP464A–SP467A: 4000

Maximum Surge Dissipation — SP460A–SP461A: 30,000 V, 25,000 A; SP462A–SP463A: 20,000 V, 10,000 A; SP464A–SP467A: 40,000 V, 30,000 A

Rated Current — 125 V, 15 A, 1875 W

Indicators — LEDs: (1) Protection, (3) Wiring Fault

Size — 1.5"H x 4.4"W x 8"D (3.8 x 11.3 x 20.3 cm)

Weight — 0.7 lb. (0.3 kg)

Item	Code	Price
Surge Soldier (8-Outlet Protector)		
Beige	SP460A	$39.95
Black	SP461A	$39.95
with RJ-11 Telephone/Fax/Modem Protection		
Beige	SP462A	$49.95
Black	SP463A	$49.95
Surge Soldier Plus (8-Outlet Protector)		
Beige	SP464A	$59.95
Black	SP465A	$59.95
with RJ-11 Telelphone/Fax/Modem Protection		
Beige	SP466A	$69.95
Black	SP467A	$69.95

Wallmount Surge Protector

The Perfect Compact Power Protector for Just Two Devices.

- Plugs directly into the wall socket.
- Ideal for PCs, fax machines, and home electronic equipment.
- An LED indicates surge suppression is operating and protecting your equipment.
- Fax/modem model includes RJ-11/RJ-45 socket and 6-ft. (1.8-m) phone line.

FAXBACK INFORMATION
Request Document Number: 16115
Call 412-746-5500 Anytime

SPECIFICATIONS

Clamping Level — SP480A: 130 V; SP481A: 165 V

EMI/RFI Filtration — Up to 55 dBs

Maximum Joules — SP480A: 320; SP481A: 100

Maximum Surge Dissipation — SP480A: 20,000 V, 18,000 A; SP481A: 10,000 V, 3000 A

Rated Current — 125 V, 15 A, 1875 W

Size — 1.5"H x 3.3"W x 5.8"D (3.8 x 8.4 x 14.6 cm)

Weight — 0.5 lb. (0.2 kg)

Item	Code	Price
Wallmount Surge Protector	SP480A	$24.95
with Fax/Modem Protection	SP481A	$34.95

Premium Surge Protectors

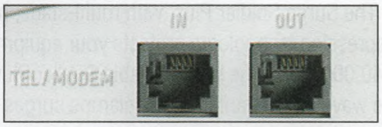
Here's the BEST Surge Protection You Can Get for Home and Office!

STANDARD
ADVANCED
MAXIMUM
SP410A
SP412A
SP418A
BLACK BOX

BUYER'S GUIDE

FOR COMPARISON: SURGE PROTECTORS

Features	★ STANDARD	★★ ADVANCED	★★★ MAXIMUM
UL1449 Clamping Level	330 Volt	330 Volt	330 Volt
EMI/RFI Filtration	0–25 dB	20–40 dB	40–60 dB
IEEE Let-Through Voltage	< 150 Volts	< 140 Volts	< 100 Volts
Single-Pulse Energy Rating	360 Joules	480 Joules	720 Joules
Peak Current NM/CM	27,000 Amps	36,000 Amps	54,000 Amps
Plugstrip	6-Outlet SP410A	8-Outlet SP412A	8-Outlet SP414A
Wallmount *Includes Telephone-Line Protection.		6-Outlet SP416A	6-Outlet SP418A*



Close-up: SP418A with Telephone Protection; In Connector (left); Out Connector (right)

- **Maximum Surge Protectors feature extremely low let-through rate, filter EMI/RFI between 40–60 dB, and are rated 720 joules maximum!**
- **Advanced Surge Protectors offer protection against strong surges. Ideal for home or office equipment such as faxes, modems, and phones.**
- **Standard Surge Protectors offer the best in basic equipment protection. LEDs tell your you your surge protection is working.**

You never know when an incoming line will have the urge to surge. So protect your valuable datacomm, phone, and television equipment with BLACK BOX® Premium Surge Protectors.

Our Surge Protectors offer the most protection for any environment from personal applications to office equipment to networks. Choose the Surge Protector that's right for you in either plugstrip or wallmount models.

Our maximum Surge Protectors provide the best defense for network-connected equipment—up to 720 Joules. And let-through voltage is low—less than 10 volts. The SP418A version also includes telephone-line protection for faxes, modems, and phones.

If you need to protect equipment in your business or home, choose our smart-priced advanced or standard Surge Protectors.

SPECIFICATIONS

EMI/RFI Filtration — SP410A: 0–25 dB; SP412A, SP416A: 20–40 dB; SP414A, SP418A: 40–60 dB

Frequency Range — 60/50 Hz

Line Voltage — 120 Volts

Maximum Joules — SP410A: 360; SP412A, SP416A: 480; SP414A, SP418A: 720

Protection Modes — All models: Line to Neutral, Line to Ground, Neutral to Ground; SP418A Telephone-Line Protection: Tip to Ground, Ring to Ground

Rated Current — 15 A

Response Time — Instantaneous

Indicators — (2) LEDs: Protection, Wiring

Item	Code	Price
Premium Surge Protectors		
Plugstrip		
6-Outlet Standard	SP410A	**$31.95**
8-Outlet Advanced	SP412A	**$61.95**
8-Outlet Maximum	SP414A	**$86.95**
Wallmount		
6-Outlet Advanced	SP416A	**$49.95**
6-Outlet Maximum with RJ-11 Telephone Protection	SP418A	**$89.95**

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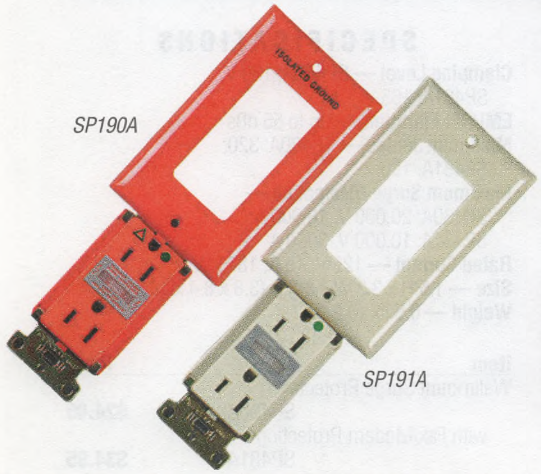
2-Outlet In-Wall Surge Protector

In-Wall Surge Protection You Can Count On.



- **LEDs signal your Surge Protector is working.**
- **Choose from a heavy-duty Hospital-Grade device or an Isolated-Ground model.**

With 2-Outlet In-Wall Protectors, you can upgrade any standard two-outlet AC wallbox to a power source that meets UL®, CSA, and IEEE standards for Transient Voltage Surge Suppressors (TVSS). The SP190A is a heavy-duty Hospital-Grade receptacle for extra-sensitive equipment. The SP191A is the Isolated-Ground model. Both offer side and back connectors for easy installation.

SPECIFICATIONS

EMI/RFI Filtration — None

Maximum Joules — 80

Rated Current — 15 A

Indicators — LED: Protection

Size — 4.1"H x 1.8"W x 1.5"D (10.4 x 4.6 x 3.8 cm)

Weight — 0.3 lb. (0.1 kg)

MORE! Surge Protectors, see pp. 175–178, 180–183.

Item	Code	Price
Mid-Range 2-Outlet In-Wall Protector		
Hospital Grade	SP190A	**$40.00**
Isolated Ground	SP191A	**$45.00**

Power Strips • Rackmount Surge Suppressors

Organize Your Power Cords with Rackmountable Power Strips and Surge Suppressors.

- **Keep your rack neat and plug your equipment into one central location in your rack.**
- **Choose models with or without switches.**
- **Get surge protection with the SP models.**
- **Installation is fast and easy. Just bolt onto the cabinet rails, plug your equipment into the Strip, and then plug the Strip into an AC outlet.**

Power Strips

The PS186A and PS189A both feature a switch/pilot light. The PS189A is designed with front-access outlets spaced 3" apart to hold multiple AC transformers. The PS188A is switchless.

The 70" PS187A-R2 mounts vertically in our 83" Relay Racks and Comm Cabinets (**pp. 162, 166**).

Rackmount Surge Suppressors

The SP187A and SP211A offer standard surge protection. The Premium model, SP215A, offers extra-sensitive protection and fail-safe shutdown circuitry that cuts power should the surge element fail.

The SP211A and SP215A are switchless to prevent accidental shutoffs.

NOTE: For more information, see ***page 169.***

Affordable Outlet Strip!
330-V Clamping Level

Top: Front of Rackmount Power Strip, Switchless (PS188A);
Middle: Rackmount Surge Suppressor (SP187A);
Bottom: Back of Premium Rackmount Surge Suppressor (SP215A)

Right: 70" Rack Power Strip (PS187A-R2)

FAXBACK INFORMATION
Request Document Number: 16490
Call 412-746-5500 Anytime

BUYER'S GUIDE

RACKMOUNT POWER STRIPS AND SURGE SUPPRESSORS

Item	On/Off Switch	Outlets	Surge Protection	Clamping Voltage	IEEE Let-Through	EMI/RFI Noise	Single-Pulse Energy Rating	Peak Current	Code	Price
19" Rackmount Power Strip	✓	6 Rear							PS186A	**$74.95**
		6 Rear							PS188A	**$69.95**
	✓	6 Front							PS189A	**$69.95**
70" Rackmount Power Strip		11 Front							PS187A-R2	**$79.95**
400-V Rackmount Surge Suppressor	✓	6 Rear	✓	400 V	336V	40 dB	210 joules	13,000 Amps	SP187A	**$84.95**
		6 Rear	✓	400 V	336V	40 dB	210 joules	13,000 Amps	SP211A	**$79.95**
Premium Rackmount Surge Suppressor		6 Rear	✓	330 V	260 V	60 dB	420 joules	33,000 Amps	SP215A	**$123.95**

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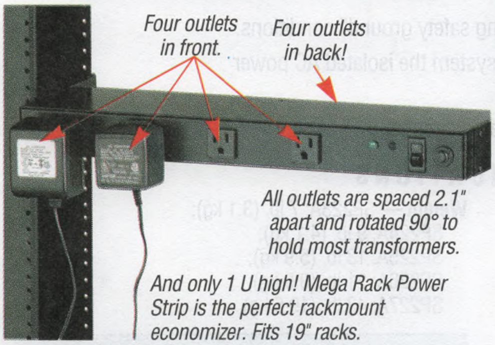

All outlets are spaced 2.1" apart and rotated 90° to hold most transformers.

And only 1 U high! Mega Rack Power Strip is the perfect rackmount economizer. Fits 19" racks.

FAXBACK INFORMATION
Request Document Number: 16452
Call 412-746-5500 Anytime

Mega Rack Power Strip

State-of-the-Art Surge Protection. Plus Plenty of Room to Plug In up to Eight Transformers!

- Ingenious design accommodates eight transformers or devices.
- The best price-per-outlet for a surge-protected power strip.
- 15-amp, 125-volt, 1875-watt output rating.
- The Mega Rack is recessed into your data-center rack to protect transformers from being accidentally knocked loose.

NOTE: For more information, see ***page 169.***

SPECIFICATIONS

EMI/RFI Noise Protection — 20 dB
IEEE Let-Through Voltage — < 340 V
Single-Pulse Energy Rating — 360 Joules
UL® 1449 Clamping Level — 400 V
Power — 115 VAC, 60 Hz
Size — 1.7"(1 U) H x 17"W x 4.5"D (4.3 x 43.2 x 11.4 cm)
Weight — 5 lb. (2.3 kg)

Item	Code	Price
Mega Rack Power Strip	SP195A	**$189.95**

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Power Control **Big Protection—Slim Profile.**

- **Guards your equipment against electrical spikes, quick power dips, and brownouts.**
- **Sine-wave tracking for fast, reliable protection.**
- **Diagnostics displayed via front-panel LEDs.**

When you have the Power Control, your equipment is safe! That's because the Power Control has unique sine-wave tracking. (The sine wave represents the lows and highs in electrical flow.) The tracking places a let-through (clamping) around the entire sine wave for fast protection.

The Power Control features advanced diagnostics to indicate voltage dips, reversed wiring at the outlet, no grounding, and circuit-suppression damage.

SPECIFICATIONS

Max. Single Pulse Transient Current — 26,000 A
Max. Single Pulse Transient Energy — 300 Joules
Protection Modes — Line to Neutral, Line to Ground, Neutral to Ground
Response Time — Instantaneous
Size — 1.8"H x 13.5"W x 13.5"D (4.6 x 34.3 x 34.3 cm)
Weight — 4 lb. (1.8 kg)

FAXBACK INFORMATION
Request Document Number: 14591
Call 412-746-5500 Anytime

ABSOLUTELY GUARANTEED FOR LIFE

BLACK BOX
POWER CONTROL

The slim-bodied Power Control fits unobtrusively on your desk. It may be small, but it offers big protection against electrical disturbances, and breakages.

Item	Code	Price
Power Control	SP179A	**$129.00**

For Backup Power Supplies, see pages 175–178, 180–181.
For Data-Line Protectors, see pages 187–194.

New
1250
APC

Line-R Power Conditioners Give Equipment Clean Electrical Power—with Audible and Visual Alarms.

- **Continuous line conditioning prevents data loss from power sags, brownouts, and overvoltages.**
- **Visual and audible indicators alert you to power anomalies.**
- **High-performance EMI/RFI noise isolation prevents data corruption.**
- **Multi-stage surge suppression prevents catastrophic equipment damage.**

Line-R™ Power Conditioners stop the damage caused by sags and brownouts. Line-R regulates incoming line voltage. Line-R will step up low voltage and step down high voltage to levels suitable for your equipment.

Use the Line-R 600 for:

- 386/486 systems
- POS equipment
- Small phone systems
- Fax machines
- Test and industrial-control equipment
- Home-entertainment equipment

Use the Line-R 1250 for:

- Multiple systems
- Mini computers
- Phone systems
- Laser printers
- Test and industrial-control equipment

The Line-R Includes:

- Surge suppression
- Surge-protection integrity indicator
- Noise isolation
- Site wiring fault indicator
- Input voltage meter
- Audible alarm
- Resettable circuit breaker
- (4) NEMA 5-15R output receptacles

TWO-YEAR 2 FREE WARRANTY

SPECIFICATIONS

Alarm — Sounds for uncorrectable input voltage
Clamping Response — <5 ns
EMI/RFI Filtering — 33–55 dB over 100 KHz–10 MHz
Load Capacity — PS221A: 600W, 600VA; PS222A: 1250W, 1250VA
Maximum Input Current — PS221A: 8 Amps; PS222A: 15 Amps
Surge Energy Capability — 320 joules
Voltage Regulation — ANSI C84.1-B: Input: 88–150 V, Output: 106–127 V
Power — 115 VAC, 60 Hz
Size — 5"H x 6.8"W x 8.4"D (12.7 x 17.3 x 21.3 cm)
Weight — PS221A: 11 lb. (5 kg); PS222A: 15.5 lb. (7 kg)

LIFETIME EQUIPMENT PROTECTION

$25,000

APC® WILL REPAIR OR REPLACE ANY EQUIPMENT THAT IS DAMAGED BY A SURGE WHILE PROTECTED BY A PROPERLY INSTALLED Line-R™. (VALID IN THE U.S. AND CANADA. SEE WARRANTY FOR DETAILS.)

FAXBACK INFORMATION
Request Document Number: 18193
Call 412-746-5500 Anytime

Item	*APC Part #*	Code	Price
Line-R 600 Power Conditioner	*LR600*	PS221A	**$179.00**
Line-R 1250 Power Conditioner	*LR1250*	PS222A	**$269.00**

◆ ◆ ◆

Line-Shaper Noise Protectors Give Equipment Clean Electrical Power—without a Dedicated Circuit.

- Front-panel LEDs indicate "power on" and "missing safety ground" conditions.
- Low-impedance isolation transformer gives your system the isolated AC power it needs for maximum performance.
- Portable—your equipment isn't chained to dedicated circuits.

LINE SHAPER 120
LINE SHAPER 840
BLACK BOX
LINE SHAPER 1440

Line-Shaper Noise Protectors: Top, SP223A; Middle, SP226A; Bottom, SP227A

SPECIFICATIONS

50-Ohm Insertion Loss — 3 dB typical at 4 KHz, 30 dB typical at 15 KHz, 60 dB typical at >100 KHz
Load Regulation Response Time — < 2 milliseconds for 50% change in load
Power — SP223A: 120VA; SP224A: 240VA; SP225A: 480VA; SP226A: 840VA; SP227A: 1440VA
Size — SP223A–SP224A: 3.5"H x 4.3"W x 6.8"D (8.9 x 10.9 x 17.3 cm); SP225A: 4.1"H x 5"W x 7.6"D (10.4 x 12.7 x 19.3 cm); SP226A: 4.1"H x 8.1"W x 11.8"D (10.4 x 20.6 x 30 cm); SP227A: 5.3"H x 11.1"W x 16.1"D (13.5 x 28.2 x 41 cm)
Weight — SP223A: 7 lb. (3.1 kg); SP224A: 9 lb. (4.1 kg); SP225A: 13 lb. (5.9 kg); SP226A: 21 lb. (9.5 kg); SP227A: 43 lb. (19.5 kg)

FAXBACK INFORMATION
Request Document Number: 13662
Call 412-746-5500 Anytime

Item	Code	Price
Line-Shaper Noise Protectors		
120VA	SP223A	**$164.00**
240VA	SP224A	**$245.00**
480VA	SP225A	**$395.00**
840VA	SP226A	**$665.00**
1440VA	SP227A	**$978.00**

Black Box Explains...

Common-Mode Disturbances.

Common-mode (also known as neutral-to-ground) disturbances disrupt the electrical ground signal reference used by microprocessor systems. These disturbances often take the form of noise and are generated two different ways.

A disturbance can be *induced* into your electrical wiring in a number of ways from minor static from dry winter air to lightning.

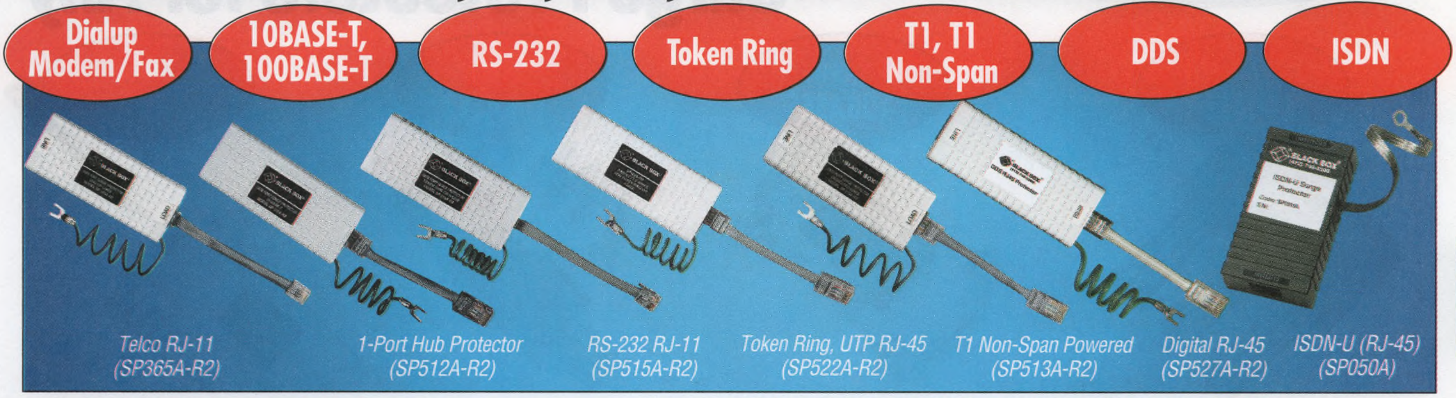
A disturbance can also be *conducted* into the electrical system by all devices using electrical power. Ironically, your system can be its own worst enemy—personal computers, faxes, copiers, and printers are significant contributors of conducted neutral-to-ground disturbances.

To prevent these disturbances and the resulting downtime, you need a power conditioner (line shaper) that includes a surge diverter, noise filter, and isolation transformer.

Overcurrent & Overvoltage Protection!

Telco, CSU/DSU, T1 Non-Span, T1, DDS, ISDN Surge Protectors

Protect Your Telco, T1, DDS, and ISDN Communication Lines.



With BLACK BOX® Surge Protectors, You Get:

- Protection against ground spikes, electrostatic discharge, AC power interference, or nearby lightning-induced energy in outdoor cable or long cable runs.
- Add-on protection for modems, CSU/DSU, T1, and other telco devices designed to span long cable runs that are susceptible to noise and surges.
- High-speed, high-energy handling capability.
- Low shunt capacitance to reduce signal loss.

Telco (Dial Modem/Fax) RJ-11 Surge Protector (SP365A-R2)

- Guard your fax machines, phone system, and modems.
- Overcurrent and overvoltage protection.

10BASE-T Hub Surge Protector, RJ-45 (SP512A-R2)

- Minimal effect on data speed.
- Guard your 10BASE-T hubs and networks from electrical damage.
- Eight-wire protection for RJ-45 connectors.

RS-232 Surge Protector, RJ-11 (SP515A-R2)

- Affordable protection from nearby lightning-induced energy—handling both line-to-ground and line-to-line surges.
- High data rates: over 40 Mbps.
- Ideal for short-haul modems, concentrators, A/B switches, muxes, repeaters, or other devices designed to span long cable runs that are prone to noise and surges.

Token Ring Surge Protector, UTP, RJ-45 (SP522A-R2)

- Protect your MAUs, repeaters, and other Token Ring devices.
- Overcurrent and overvoltage protection.
- Installs directly at the interface port.

T1 Non-Span, RJ-45 (SP513A-R2)

- Protect your non-span powered T1 equipment.
- Overcurrent and overvoltage protection.
- Eight-wire protection for RJ-45 connectors.

In-Line Installation! Low Signal Loss!

T1 Surge Protector, RJ-45 (SP526A)

- Custom-wired to guard the four active leads on a standard T1 line.
- Easy installation. Plug in between the data line and I/O port.

DDS Surge Protector, RJ-45 (SP527A)

- Custom-wired to guard the four active leads on a standard DDS line.
- Easy installation.

ISDN Data-Line Surge Protectors, RJ-545 (SP050A, SP060A)

- Protects terminal adapters, NTUs, and other ISDN equipment.
- Choose from models for the U and ST® interfaces.
- Use the fastest suppression technology available for high reliability and security.
- UL® listed. IEC conformance.

FAXBACK INFO
Request Document Number: 16421
Call 412-746-5500
Anytime

BUYER'S GUIDE

TELCO, 10BASE-T, RS-232, T1 NON-SPAN, T1, DDS, ISDN SURGE PROTECTORS

Connector Type	Wires Protected	Telco (Dialup Modem/Fax)	10BASE-T 100BASE-T Ethernet	RS-232	Token Ring	T1 Non-Span	T1	DDS	ISDN
RJ-11		SP365A-R2		SP515A-R2					
RJ-45	3, 4, 5, 6 (4 Center Pins)	SP365A-R2			SP522A-R2				SP050A
	1, 2, 7, 8							SP527A	
	1, 2, 4, 5						SP526A		SP513A-R2
	All pins		SP512A-R2			SP513A-R2			SP060A
Standard Clamping Voltage		240 V	8 V	RJ-11: 27 V RJ-45: 18 V	RJ-11: 27 V RJ-45: 18 V	60 V	60V	60V	60V

CE Approval — All items listed are approved except SP526–SP527 and SP060

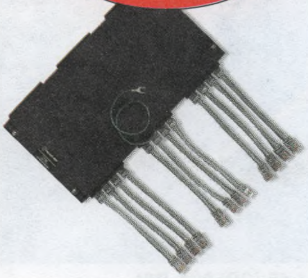
Item	Code	Price
Telco RJ-11 Surge Protector	SP365A-R2	**$39.00**
10BASE-T Hub Surge Protectors, RJ-45, 1-Port	SP512A-R2	**$65.00**
RS-232 Surge Protector, RJ-11	SP515A-R2	**$39.00**
Token Ring Surge Protector, UTP RJ-45	SP522A-R2	**$65.00**

Item	Code	Price
T1 Non-Span Surge Protector	SP513A-R2	**$79.00**
T1 Surge Protector, RJ-45	SP526A	**$52.00**
DDS Surge Protector, RJ-45	SP527A	**$52.00**
ISDN-U Data-Line Surge Protectors		
U Interface	SP050A	**$54.95**
ST Interface (8-Pin)	SP060A	**$89.95**

PLUS! CAT5 Surge Protectors, see p. 194.

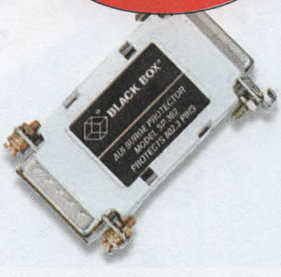
Surge Protectors for *Any*

UTP Ethernet 10BASE-T



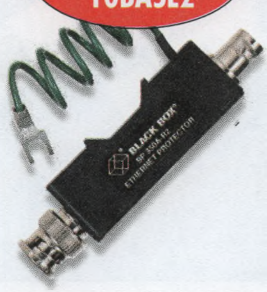
12-Port Hub Protector (SP532A)

Ethernet 10BASE5



AUI (SP362)

ThinNet 10BASE2



Thin Protector-ST (SP350A-R2)

Token Ring

Type-B Data Connector (SP509A-R2)

10BASE-T Hub Surge Protectors (SP362, SP512A-R2, SP530A–SP532A)

- **Absolute network reliability.**
- **Minimal effect on data speed.**

Compared with other LAN topologies, 10BASE-T is easy to use and inexpensive but it still needs serious data-line protection.

The twisted-pair cable used in 10BASE-T networks is more susceptible to electrical noise than shielded cable. And because 10BASE-T is so easy to move and change, it's easy to inadvertently run cable near sources of noise.

Your data and equipment are valuable—so protect your 10BASE-T network from electrical damage. The neat and easy way is with a BLACK BOX® 10BASE-T Hub Surge Protector. Just one Protector guards up to 12 ports on a 10BASE-T Hub.

Ethernet Surge Protectors (SP350A-R2, SP362, SP501A, SP505A–SP506A)

- **Available for standard ("Thick") coax (10BASE5) and Thin coax (10BASE2).**
- **Extremely sensitive, state-of-the-art avalanche diode technology.**
- **Low signal loss.**
- **High-speed, high-energy handling capability.**
- **7-volt clamp.**

You can't afford to lose your network to ground spikes or nearby lightning-induced energy surges. Protect those Ethernet data lines—especially the long cable runs associated with bridges and routers. These Ethernet Surge Protectors from Black Box feature easy in-line installation directly at the interface port.

Token Ring Surge Protectors (SP509A-R2, SP361A-R2, SP515A-R2, SP522A-R2)

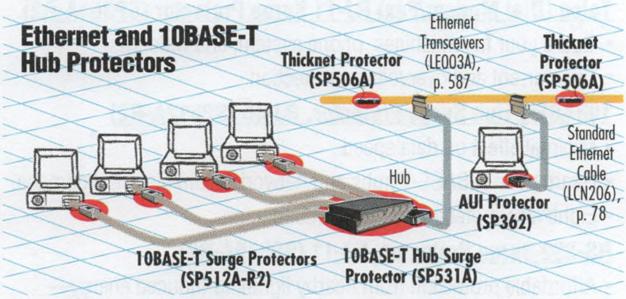
- **Absolute network reliability.**
- **Low signal loss.**
- **Easy in-line installation.**
- **Available for RJ-45, DB9, and IBM® data connectors.**

Don't let surges damage your network. These Token Ring Surge Protectors are designed to be installed easily and directly at the interface port. Perfect for MAUs, repeaters, or other devices that span long cable runs.

FAXBACK INFORMATION
For Ethernet Surge Protectors: 11141,
For Twinax Surge Protectors: 10872,
Call 412-746-5500 Anytime

CE Approval — All items listed are approved

Ethernet and 10BASE-T Hub Protectors


Thicknet Protector (SP506A)
Ethernet Transceivers (LE003A), p. 587
Thicknet Protector (SP506A)
Standard Ethernet Cable (LCN206), p. 78
Hub
AUI Protector (SP362)
10BASE-T Surge Protectors (SP512A-R2)
10BASE-T Hub Surge Protector (SP531A)

BUYER'S GUIDE

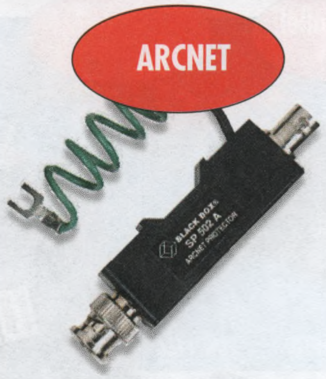
LAN SURGE PROTECTORS

Connector Type	Network Type		
	UTP Ethernet 10BASE-T	**Ethernet 10BASE5**	**Thin Ethernet 10BASE2**
IBM Data			
Coaxial, BNC			SP501A ("T") SP350A-R2 (M/F)
Coaxial, "N" Series		SP505A (F/F) SP506A (M/F)	
Twinax			
DB9			
DB15	SP362	SP362	SP362
DB25 4-Wire Serial 8-Wire Serial All Wires			
RJ-11 UTP			
RJ-45 UTP 1-Port 4-Port 8-Port 12-Port	SP512A-R2 SP530A SP531A SP532A		
Standard Clamp Voltage	7.5V	7.5V	9.0 V
Peak Pulse Current	750 A	750A	750A
Response Time	<10 nsec	<10 nsec	<10 nsec
Max. Shunt Capacity	<40 pF	<30 pF	<30 pF
Insertion Loss @ 40 MHz			-0.5 db

Protectors

LAN—from Black Box!

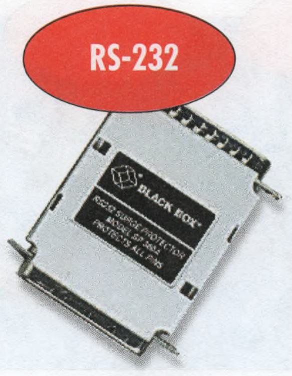
PLUS! Telco, T1, CSU/DSU & Special-Application Surge Protectors, **see pp. 187 and 190.**



ARCNET (SP502A)

Twinax, AS/400, S/3X

Twinax (M/F (SP524A)



DB25 RS-232
All Wires (SP360A)

RS-422, -423, -485

DB15 RS-422
(SP508A)

ARCNET Surge Protectors (SP502A)

- **Extremely sensitive, state-of-the-art avalanche diode technology.**
- **Low signal loss.**
- **High-speed, high-energy handling capability.**
- **7-volt clamp.**

Twinax Surge Protectors (SP509A-R2, SP512A, SP524A–SP525A)

- **Ideal for IBM® AS/400®, System 3X, and 3270.**
- **Male or female for direct installation at port.**
- **Extremely sensitive state-of-the-art avalanche diode technology.**

Just plug your cables into a Protector at each end of your system and ground them both.

NOTE: Must be used in pairs.

RS-232/V.24 Surge Protectors (SP361A-R2, SP507A, SP140A–SP141A, SP360A, SP515A-R2, SP522A-R2)

- **Extremely sensitive, state-of-the-art avalanche diode technology.**
- **Minimal signal loss.**
- **Data rates over 40 Mbps.**
- **Simple installation at the port.**
- **Absolute network reliability.**

Protect every data connection in your system. RS-232 Surge Protectors are perfect add-ons for short-haul modems, concentrators, A/B switches, muxes, repeaters, or other devices that are designed to span long cable runs but are prone to noise and surges.

RS-232 Protectors are available with DB9, DB15, DB25, or RJ-11 connections.

RS-422, -423, -485 Surge Protectors (SP361A-R2, SP508A)

- **Extremely sensitive, state-of-the-art avalanche diode technology.**
- **Minimal signal loss.**
- **Data rates over 40 Mbps.**
- **Simple installation at the port.**

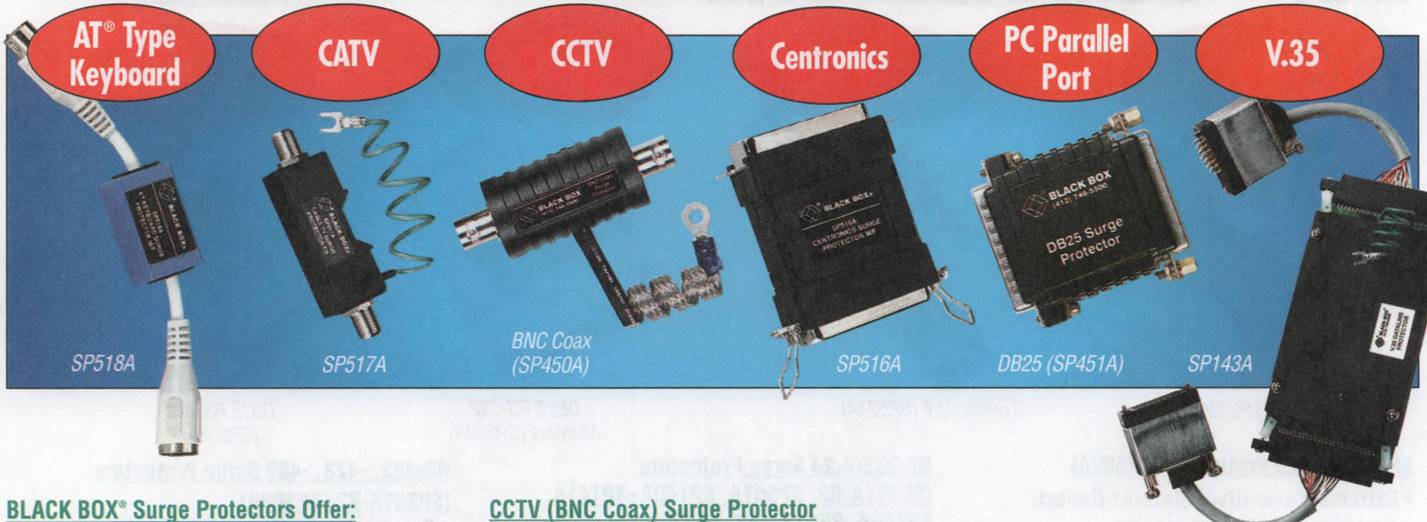
RS-422 Surge Protectors are perfect add-ons for short-haul modems, concentrators, A/B switches, muxes, repeaters, or other devices that are designed to span long cable runs but are prone to noise and surges.

Token Ring	ARCNET®	AS/400® System 3X	RS-232	RS-422, RS-423 RS-485
SP509A-R2		SP509A-R2		
	SP502A (M/F)			
		SP524A (F/F) SP525A (M/F)		
SP361A-R2			SP361A-R2	SP361A-R2
			SP507A	SP508A
			SP141A SP140A SP360A	
SP515A-R2			SP515A-R2	
SP522A-R2		SP512A-R2	SP522A-R2	
18V	30V	10V	18V	7.5V
340 A	370 A	500 A	340 A	750 A
<10 nsec	<10 nsec	<10 nsec	<10 nsec	<10 nsec
<40 pF	<30 pF	<30 pF	<40 pF	<40 pF
	-0.5 db	-0.5 db		

Item	Code	Price
10BASE-T Hub Surge Protectors (RJ-45)		
1-Port	SP512A-R2	**$65.00**
4-Port	SP530A	**$170.00**
8-Port	SP531A	**$295.00**
12-Port	SP532A	**$425.00**
Ethernet Surge Protectors		
AUI	SP362	**$79.00**
Thin Protector-ST® In-Line	SP350A-R2	**$49.00**
Thin Protector-T Protected Tee	SP501A	**$52.00**
Thicknet F/F	SP505A	**$56.00**
M/F	SP506A	**$56.00**
Token Ring Surge Protectors		
Type B Data Connector	SP509A-R2	**$98.00**
DB9	SP361A-R2	**$60.00**
UTP (RJ-45)	SP522A-R2	**$65.00**
RJ-11 Protector	SP515A-R2	**$39.00**
ARCNET® Protector-ST In-Line	SP502A	**$49.00**
Twinax (AS/400, S/3X) Surge Protectors		
M/F	SP524A	**$66.00**
F/F	SP525A	**$66.00**
RS-232 Surge Protectors		
DB9 Protector	SP361A-R2	**$60.00**
DB15 Protector	SP507A	**$55.00**
DB25 Protectors		
4-Wire Serial	SP141A	**$39.00**
8-Wire Serial	SP140A	**$60.00**
All Wires	SP360A	**$65.00**
RJ-11 Protector	SP515A-R2	**$39.00**
UTP (RJ-45)	SP522A-R2	**$65.00**
RS-422 Surge Protectors		
DB9 Protector	SP361A-R2	**$60.00**
DB15 Protector	SP508A	**$55.00**

Special-Application Surge Protectors

Protect Keyboards, Printers, Video and V.35 Equipment.



BLACK BOX® Surge Protectors Offer:

- Quick, in-line installation.
- Protection against ground spikes or nearby lightning-induced energy in outdoor cable or long cable runs.

AT Keyboard Surge Protector (SP518A)

- Ideal for use between an AT® keyboard and your PC. Perfect for video/keyboard switches, too.
- Simple in-line installation at the port.

PS/2 Keyboard Surge Protector (SP519A) (not shown)

- Ideal for use between a PS/2® keyboard and your PC.
- Simple in-line installation at the port.

CATV Surge Protector (SP517A)

- Ideal for use with your CATV equipment.
- Simple in-line installation at the port.

CCTV (BNC Coax) Surge Protector (SP450A)

- Connects directly to CCTV coax transmission lines.
- Ideal for elevated CCTV cameras.

Centronics Surge Protector (SP516A)

- Ideal for keyboards, printers, video extenders, keyboard/video switches, video splitters, and other video equipment.

PC Parallel Port (DB25) Surge Protector (SP451A)

- Connects directly to DB25 parallel port—and guards all 25 pins.

V.35 Data-Line Protector (SP143A)

- Protects expensive V.35 equipment—modems, CSU/DSUs, T1 components—from incoming surges.

SPECIFICATIONS

Clamping Voltage — SP450A: 35 V;
SP143A: 30 V;
SP451A: 6.8 V;
All others: 8 V
Response Time — SP450A: <5 nsec;
All others: <10 nsec
Wires Protected — All
CE Approval — All items listed are approved

FAXBACK INFORMATION
For SP450A–SP451A: 15585,
For SP143A: 13624,
Call 412-746-5500 Anytime

VIPreview
Ask for our
Data & Equipment Protection VIPreview

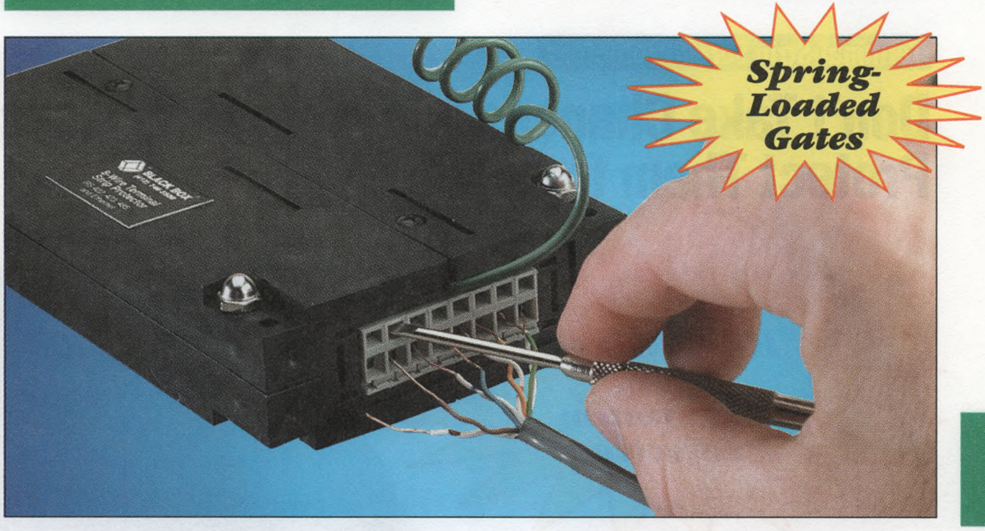
SPECIAL-APPLICATION SURGE PROTECTORS

Connector Types	AT Type Keyboard (5-Pin DIN)	PS/2 Type Keyboard (6-Pin Mini DIN)	CATV	CCTV	Centronics 36-Pin Printer Port	PC Parallel Port	V.35 Male
5-Pin DIN	SP518A						
6-Pin Mini DIN		SP519A					
CATV ("N" Series) Female			SP517A				
CCTV (BNC) Female				SP450A			
Centronics® 36-Pin Parallel					SP516A		
DB25 Parallel Port						SP451A	
V.35 Female							SP143A

Item	Code	Price
AT Keyboard Surge Protector	SP518A	**$49.00**
PS/2 Style Keyboard Surge Protector	SP519A	**$49.00**
CATV Surge Protector	SP517A	**$59.00**
CCTV (BNC Coax) Surge Protector	SP450A	**$50.00**
Centronics Surge Protector	SP516A	**$65.00**
PC Parallel Port (DB25) Surge Protector	SP451A	**$65.00**
V.35 Data-Line Protector	SP143A	**$199.00**

Quick-Connect Surge Protectors

These Data-Line Protectors Couldn't Be Easier to Install.



Easy installation with Quick-Connect connectors. Forget about incompatibility. Just strip the cable and insert.

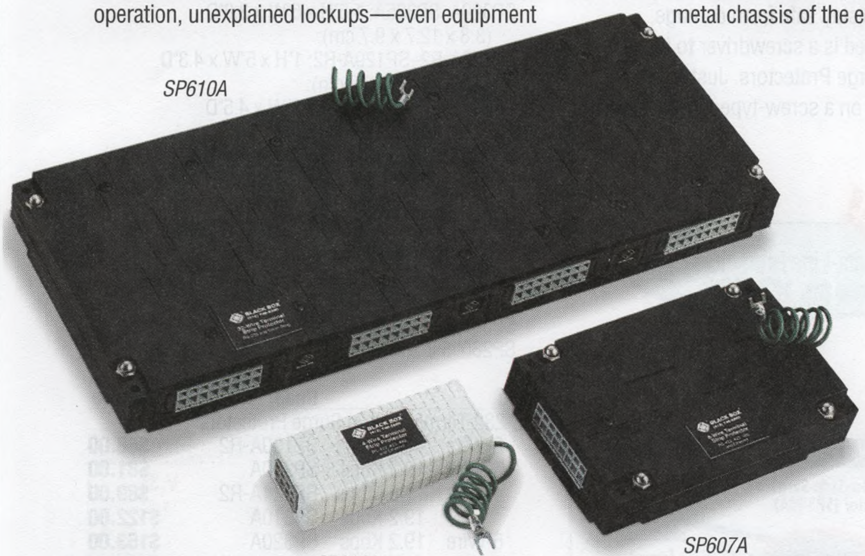
- **Easy installation, right at the port—just strip the cable and insert.**
- **Spring-loaded design prevents wires from loosening, corroding, or becoming brittle.**
- **Protection for RS-232, RS-422/423/485, Token Ring, and 10BASE-T.**
- **State-of-the-art avalanche diode technology.**
- **Low shunt capacitance to reduce signal loss.**

Keep your network and communications devices (I/O cards, controllers, programmable logic controllers, modems, CSU/DSUs, hubs, and multiplexors) up and running with these data-line surge protectors.

Even if you have power protection, surge energies as low as 18 volts from nearby fans, air conditioners, elevators, and electrical storms can still reach your equipment. Your LAN is sensitive; disruptions on your smaller data lines can cause garbage in data transmissions, disruptions in LAN operation, unexplained lockups—even equipment damage. But not when you use these Protectors!

Quick-Connect Surge Protectors are truly easy to install, too—right at the port. Simply strip the cable and insert the Protector in-series between the data cable and the comm port on the equipment.

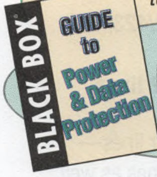
The spring-loaded design of the Quick-Connect Surge Protectors prevents the cables from loosening, corroding—even from becoming brittle over time. For complete protection, attach the Protector's grounding wire directly to the metal chassis of the equipment.



Guide to Power & Data Protection

Updated!

Find out more about the full circle of protection for your vital equipment. Call **412-746-5500** (press **1**, **3** for Customer Service) and ask for The BLACK BOX® *Guide to Power & Data Protection.*



Don't get zapped! Learn how to protect your equipment and data. See p. 635.

SPECIFICATIONS

Clamp Voltage — RS-232 and Token Ring models: ±18 V;
RS-422/423/485 and 10BASE-T models: ±7.5 V

CE Approval — All items listed are approved

Size — 2- and 4-wire models: 0.9"H x 1.5"W x 3.6"D (2.3 x 3.8 x 9.1 cm);
6-, 8-, 10-, and 32-wire models: 1.5"H x 3.5"W x 5.4"D (3.8 x 8.9 x 13.7 cm)

Weight — 2- and 4-wire models: 0.2 lb. (<0.1 kg);
6-, 8-, and 10-wire models: 0.5 lb. (0.2 kg);
32-wire models: 1.8 lb. (0.8 kg)

Item	Code	Price
Quick-Connect Surge Protectors		
RS-232 and Token Ring		
2-Wire	SP600A	**$55.00**
4-Wire	SP602A	**$85.00**
6-Wire	SP604A	**$98.00**
8-Wire	SP606A	**$119.00**
10-Wire	SP608A	**$189.00**
32-Wire	SP610A	**$379.00**
RS-422/423/485 and 10BASE-T		
2-Wire	SP601A	**$55.00**
4-Wire	SP603A	**$85.00**
6-Wire	SP605A	**$98.00**
8-Wire	SP607A	**$119.00**
10-Wire	SP609A	**$189.00**
32-Wire	SP611A	**$379.00**

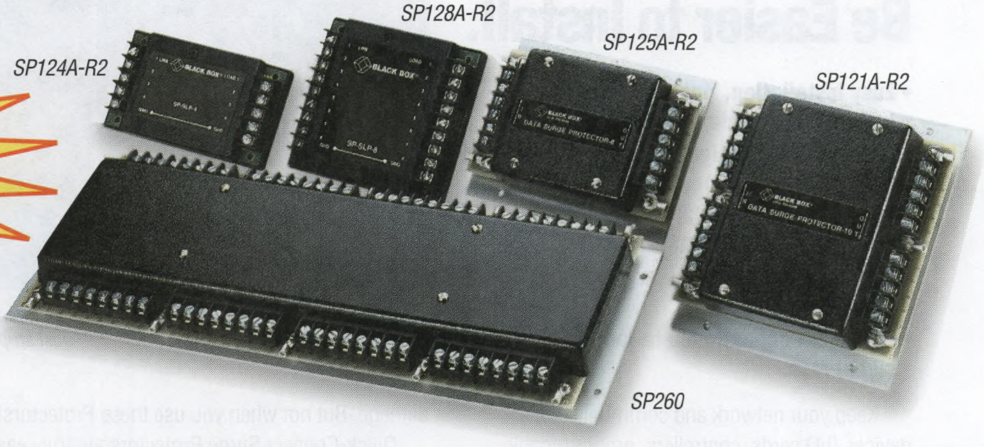
TERMINAL-STRIP APPLICATIONS

Barrier Strips	Network Type and Part-Number Selection			
	10BASE-T Ethernet	**Token Ring**	**RS-422, RS-485, RS-423**	**RS-232, V.35, or Digital 4–20 mA Current Loop**
2-Terminal	SP601A	SP600A	SP601A	SP600A
4-Terminal	SP603A	SP602A	SP603A	SP602A
6-Terminal	SP605A	SP604A	SP605A	SP604A
8-Terminal	SP607A	SP606A	SP607A	SP606A
10-Terminal	SP609A	SP608A	SP609A	SP608A
32-Terminal	SP611A	SP610A	SP611A	SP610A

Terminal-Strip Surge Protectors

Don't Take Chances with Your Data Lines—Protect Them from Surges.

Hard-Wired for Maximum Protection!



- **Protect signals, data, and data lines from damage.**
- **Install right at the port for maximum protection.**
- **Minimal signal loss.**
- **5000 volts peak handling.**
- **Models for RS-232 and RS-422/423/485 applications.**
- **Models for 2, 4, 6, 8, 10, or 32 lines.**

Surges don't hit just your power lines—they can strike through your data lines as well. Keep your data lines safe from transient over-voltages caused by electrical storms, elevator motors, generators, or heavy machinery with Terminal-Strip Surge Protectors from Black Box.

Terminal-Strip Surge Protectors guard computers, line drivers, and terminals from transient spikes—the spikes that can make your components fail or produce misregistration or false logic.

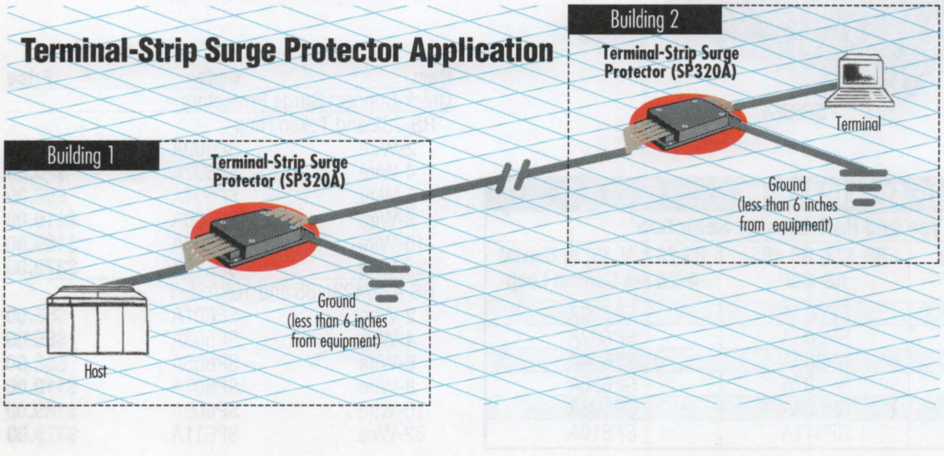
The Protectors offer the perfect solution for protection against ground spikes or nearby lightning-induced energy in outdoor cable or long cable runs. They're the ideal add-on for short-haul modems, concentrators, A/B switches, muxes, repeaters, or other devices designed to span long cable runs.

With high-speed voltage-limiting, they protect your sensitive circuitry in nanoseconds. Your components stay safe from damage.

And all you need is a screwdriver to install Terminal-Strip Surge Protectors. Just lug the wire and mount it on a screw-type terminal strip.

MORE! Data-Line Protectors, see pp. 187–191.

Terminal-Strip Surge Protector Application


Building 1
Terminal-Strip Surge Protector (SP320A)
Ground (less than 6 inches from equipment)
Host
Building 2
Terminal-Strip Surge Protector (SP320A)
Terminal
Ground (less than 6 inches from equipment)

SPECIFICATIONS

Clamp Voltage — RS-232 models: ± 25 V; RS-422 models: ± 6.8 V

Size — SP120A-R2–SP121A-R2: 1"H x 5"W x 2"D (2.5 x 12.7 x 5.1 cm); SP300A, SP305A: 1.5"H x 5"W x 5.4"D (3.8 x 12.7 x 5.1 cm); SP124A-R2–SP125A-R2: 1"H x 5"W x 2.8"D (2.5 x 12.7 x 7.1 cm); SP310A, SP315A: 1.5"H x 5"W x 3"D (3.8 x 12.7 x 7.6 cm); SP320A, SP325A: 1.5"H x 5"W x 3.8"D (3.8 x 12.7 x 9.7 cm); SP128A-R2–SP129A-R2: 1"H x 5"W x 4.3"D (2.5 x 12.7 x 10.9 cm); SP330A, SP335A: 1.5"H x 5"W x 4.5"D (3.8 x 12.7 x 11.4 cm); SP260: 16.3"H x 6"W x 1.7"D (41.4 x 15.2 x 4.3 cm)

Weight — SP120A-R2–SP121A-R2, SP124A-R2, SP125A-R2: 0.3 lb. (0.1 kg); SP300A, SP305A, SP310A: 0.4 lb. (0.2 kg); SP315A: 0.5 lb. (0.2 kg); SP128A-R2–SP129A-R2, SP320A, SP325A: 0.6 lb. (0.3 kg); SP330A, SP335A: 0.8 lb. (0.4 kg); SP260: 5 lb. (2.3 kg)

Item		Code	Price
RS-232 Terminal-Strip Surge Protectors			
2-Wire	1.5 Mbps	SP120A-R2	**$58.00**
	19.2 Kbps	SP300A	**$81.00**
4-Wire	1.5 Mbps	SP124A-R2	**$89.00**
	19.2 Kbps	SP310A	**$122.00**
6-Wire	19.2 Kbps	SP320A	**$163.00**
8-Wire	1.5 Mbps	SP128A-R2	**$138.00**
10-Wire	19.2 Kbps	SP330A	**$225.00**
32-Wire	19.2 Kbps	SP260	**$440.00**
RS-422 Terminal-Strip Surge Protectors			
2-Wire	1.5 Mbps	SP121A-R2	**$58.00**
	19.2 Kbps	SP305A	**$92.00**
4-Wire	1.5 Mbps	SP125A-R2	**$89.00**
	19.2 Kbps	SP315A	**$133.00**
6-Wire	19.2 Kbps	SP325A	**$174.00**
8-Wire	1.5 Mbps	SP129A-R2	**$138.00**
10-Wire	19.2 Kbps	SP335A	**$235.00**

remember to order cables

Different applications require different cables. Call Tech Support to be sure you order the right one.

The Rack Series • The Fast Rack Series

Surround Sensitive Data and Telco Equipment with Extra Protection.

- **Hot-swappable modular ports. Swap out lines without affecting other ports.**
- **Provides extra protection from static electricity, overvoltages, and surges.**
- **Easy front input/output access.**
- **Mount in data racks or on the wall. Both feature convenient front access.**
- **Self-resetting modular nodes.**
- **Ideal for 10BASE-T, RS-232, Token Ring, 100BASE-T, leased lines (T1 and IDSN available)—almost all communications interfaces.**

Surround your sensitive data and telco equipment with an extra safety net. Even if you have a power-protection system, transient surges created within the building, ground-loop currents, and electrostatic discharges can still get through your lines—unless you have The Rack.

These protectors are specifically designed to give added security to your data/voice and network equipment with extremely low tolerances for static electricity, voltage rises, or ground loops.

Use The Rack Series to protect one concentrator or an entire relay rack full of hubs, concentrators—even your ATM and leased lines.

Choose the rack that's right for your application. Use The Rack Series for 10BASE-T, RS-232, Token Ring, dialup lines, and most other communications interfaces. For ATM, Fast Ethernet, or other 100-Mhz applications, choose The Fast Rack Series.

SPECIFICATIONS

Peak Pulse Current —
SP810A, SP815A, SP845A, SP870A, SP875A, SP885A: 132 Amps;
SP820A, SP825A, SP855A: 60 Amps;
SP830A, SP835A, SP865A: 75 Amps

Response Time — < 5 ns

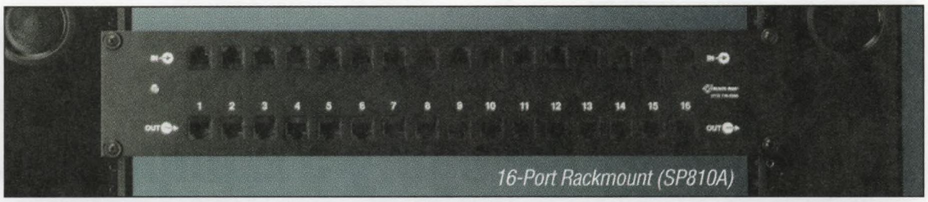
Standard Clamp Voltage — SP810A, SP815A, SP845A, SP870A, SP875A, SP885A: 7.5 volts;
SP820A, SP825A, SP855A: 18 volts;
SP830A, SP835A, SP865A: 240 volts

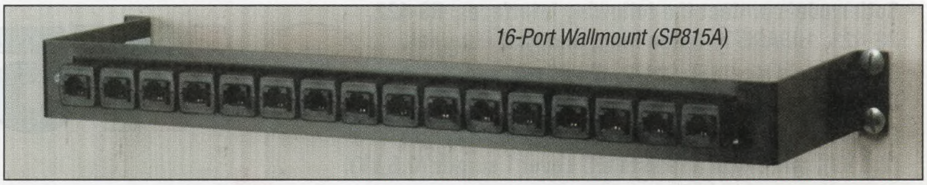
Wires Protected — 7.5- and 18-Volt Models: All;
240-Volt Models: Center wires only

Connectors — (16) or (32) RJ-45

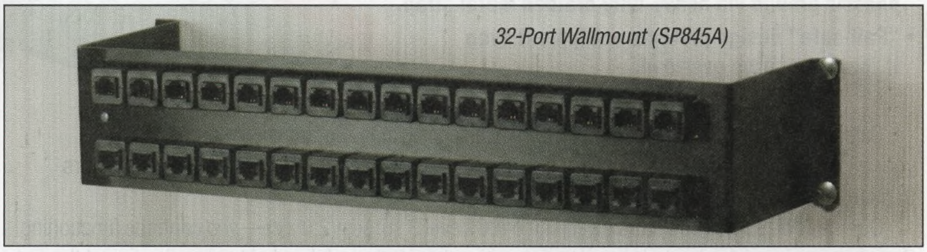
Size — SP810A, SP820A, SP830A, SP870A:
3.5"H x 19"W x 0.8"D (8.9 x 48.3 x 1.9 cm);
SP815A, SP825A, SP835A: 1.7"H x 19"W x 5.6"D (4.3 x 48.3 x 14.2 cm);
SP845A, SP855A, SP865A, SP885A:
3.5"H x 19"W x 5.8"D (8.9 x 48.3 x 14.7 cm);
SP875A: 1.8"H x 19"W x 5.8"D (4.6 x 48.3 x 14.7 cm)

Weight — 16-Port models: 1.6 lb. (0.7 kg);
32-Port models: 3.2 lb. (1.4 kg)


16-Port Rackmount (SP810A)


16-Port Wallmount (SP815A)

Available in 16-Port Rackmount versions or wallmount versions.


32-Port Wallmount (SP845A)

Mount the 32-Port Rack on the wall.

The Rack Series and Fast Rack Series are truly modular. Connect and disconnect individual ports without disrupting other ports. Continuous uptime is guaranteed. And after a power anomaly up to 1500 watts, the ports reset automatically.

FAXBACK INFORMATION
Request Document Number: 17491
Call 412-746-5500 Anytime

THE RACK SERIES

No of. Ports	Clamp Voltage	Application	Rackmount	Wallmount
16	7.5 Volts	10BASE-T, RS-422/RS-423/RS-485, CATV	SP810A	SP815A
	18 Volts	Token Ring, RS-232, Digital 4–20 mA Current Loop, Satellite TV	SP820A	SP825A
	240 Volts	Dialup voice lines, modem, and fax lines	SP830A	SP835A
32	7.5 Volts	10BASE-T, RS-422/RS-423/RS-485, CATV	SP845A	
	18 Volts	Token Ring, RS-232, Digital 4–20 mA Current Loop, Satellite TV	SP855A	
	240 Volts	Dialup voice lines, modem and fax lines	SP865A	

For FAST Applications!

THE FAST RACK SERIES

No of. Ports	Clamp Voltage	Application	Rackmount	Wallmount
16	7.5 Volts	ATM155, 100 Mbps (100BASE-T, CDDI, 100VG)	SP870A	SP875A
32	7.5 Volts	ATM155, 100 Mbps (100BASE-T, CDDI, 100VG)		SP885A

Item			Code	Price
The Rack Series				
16-Port	Rackmount	7.5 Volts	SP810A	**$575.00**
		18 Volts	SP820A	**$575.00**
		240 Volts	SP830A	**$575.00**
	Wallmount	7.5 Volts	SP815A	**$595.00**
		18 Volts	SP825A	**$595.00**
		240 Volts	SP835A	**$595.00**
32-Port	Wallmount	7.5 Volts	SP845A	**$995.00**
		18 Volts	SP855A	**$995.00**
		240 Volts	SP865A	**$995.00**
The Fast Rack Series				
16-Port	Rackmount	7.5 Volts	SP870A	**$645.00**
	Wallmount	7.5 Volts	SP875A	**$665.00**
32-Port	Wallmount	7.5 Volts	SP885A	**$1175.00**

Replacement nodes available in all clamping voltages.
Also available in 27- and 60-volt versions for ISDN and T1 lines.

CAT5 Surge Protectors

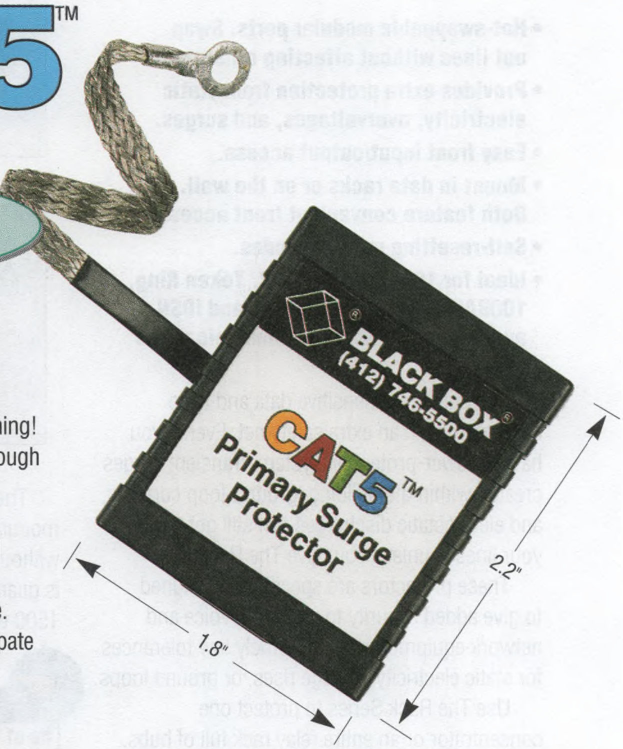
They Really Take the Heat to Protect Your Category 5 Equipment.

- **Both models protect the following interfaces: RS-422, RS-423, 10BASE-T, Token Ring, and Fast Ethernet.**
- **Both models meet IEC 801-2, IEC 801-4, and 801-5 standards.**
- **Surge-resistant. SP250A withstands Level 3 surges (2.0 kV), and SP251A resists IEC Level 1 surges (0.5 kV).**
- **Both models shunt surge energy levels safely to chassis ground via heavy-duty braided metal strap.**
- **"Fail-safe" design protects equipment even if there's a surge overload.**

CAT5™

VIPreview
Ask for our CAT5™ VIPreview.

MORE! Data-Line Protectors, see pp. 187–193.


BLACK BOX®
(412) 746-5500
CAT5™
Primary Surge Protector
2.2"
1.8"

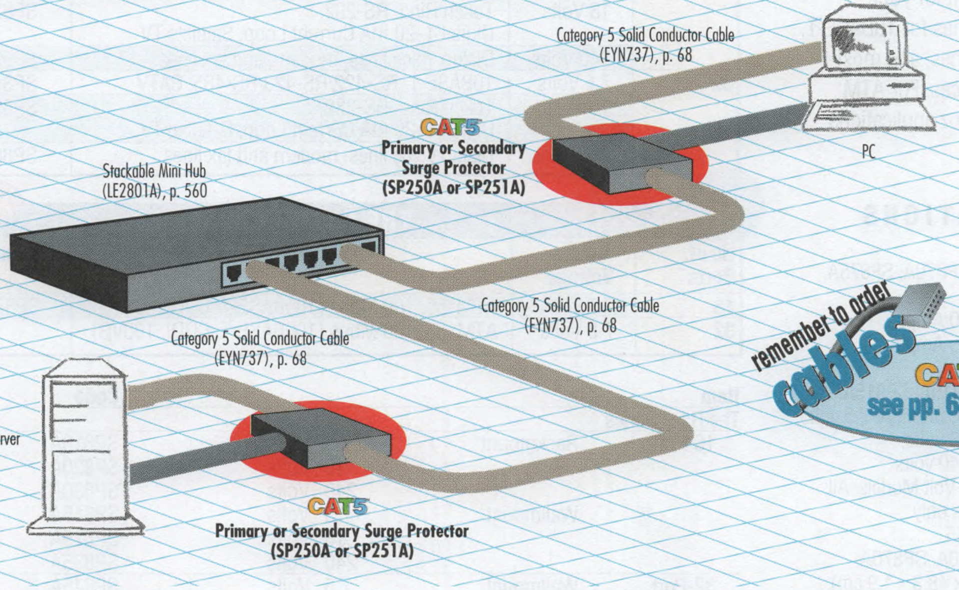
Category 5 is *the* hot networking performance specification. But transient surges can make your high-speed data lines too hot! Play it *cool,* play it safe. Install our CAT5 Surge Protectors to guard your data ports.

Our CAT5 Surge Protectors divert up to IEC Level 3 surges (2.0 kV)—*and* continue functioning! Surge energy is safely shunted away from sensitive data ports and directed to chassis ground through a heavy-duty braided metal strap.

The Primary Surge Protector (SP250A) meets IEC 801-2, 801-4, and 801-5 standards. Our Secondary Surge Protector (SP251A) complies with IEC 801-2, 801-4, and 801-5. With near-end crosstalk (NEXT) measured better than -43 dB at 100 MHz, you get extremely low insertion loss. Both CAT5 Surge Protectors appear to the network as just a few feet of cable—virtually invisible.

And these Surge Protectors aren't built just for today's networking needs—they already anticipate the networking needs of *tomorrow.* Both CAT5 Surge Protectors support all data applications through 100 Mbps.

The Bottom Line—These Surge Protectors are built to take the heat—and then some!


Category 5 Solid Conductor Cable (EYN737), p. 68
PC
CAT5 Primary or Secondary Surge Protector (SP250A or SP251A)
Stackable Mini Hub (LE2801A), p. 560
Category 5 Solid Conductor Cable (EYN737), p. 68
Category 5 Solid Conductor Cable (EYN737), p. 68
Server
CAT5 Primary or Secondary Surge Protector (SP250A or SP251A)

remember to order cables
CAT5 Cable, see pp. 68–69, 114–115.

SPECIFICATIONS

CE Approval — All items listed are approved
Power — None
Size — 2.2"H x 1.8"W x 0.8"D (5.6 x 4.6 x 2 cm)
Weight — 0.25 lb. (0.1 kg)

FAXBACK INFORMATION
Request Document Number: 15578
Call 412-746-5500 Anytime

Item	Code	Price
CAT5 Surge Protector		
Primary (to 2.0 kV)	SP250A	**$159.00**
Secondary (to 0.5 kV)	SP251A	**$99.00**
remember to order cables Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

Opto-Isolators

Unexplained System Damage? Strange Outages?

Optical Isolation Stops Ground Loops from Wreaking Havoc.

The High-Speed Opto-Isolator has two 115.2-Kbps DB25 ports.

- **Fiber optics bridge the copper circuit—a ground loop's path to destruction.**
- **Stop ground potentials up to 2500 volts.**
- **High-speed unit guards RS-232 serial ports operating up to 115.2 Kbps.**

Black Box Explains...

Ground Loops.

A ground loop is a current across a conductor, created by a difference in potential between two grounded points, as in two buildings connected by a run of RS-232 or other data line. When two devices are connected and their potentials are different, voltage flows from high to low by traveling through the data cable. If the voltage potential is large enough, your equipment won't be able to handle the excess voltage and one of your ports will be damaged.

You can't test for ground loops. You don't know you have one until a vital component fails. Only prevention works—use optical isolation or fiberoptic cable on all your long data lines.

When you link two devices powered by separate AC sources, you create the potential for a ground-loop surge—a damaging electrical condition that can destroy your computer and wipe out data. But BLACK BOX® Opto-Isolators interrupt that lethal pathway by completing the connection between the two devices using an internal fiberoptic link.

Data signals, converted to light pulses inside the Isolator, continue along on the circuit. But the fiberoptic air gap stops ground loops from wreaking havoc with your hardware.

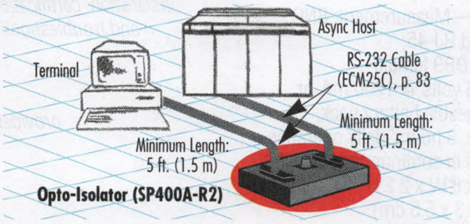
With BLACK BOX® Opto-Isolators, your equipment is effectively isolated from ground-loop potentials, up to 2500 volts.

Our **High-Speed Opto-Isolator (SP340A)** is designed especially to protect computer devices equipped with superfast 115.2-Kbps serial ports.

The **Opto-Isolator (SP400A-R2)** protects RS-232 lines up to 200 feet (61 m), or to 500 feet (152.4 m) with the optional 9-VDC Power Supply.

Opto-Isolator II (SP402A) has an RS-422/485 interface and a 4-screw terminal instead of RJ-45 ports.

The **RS-422/485 Opto Isolator (SP401A)** can protect RS-422/485 lines up to 2000 feet (609.6 m). Order the special converter model (IC107A-R2) listed on **page 324** to protect *and* convert RS-232-to-RS-422/485 lines.


Async Host
Terminal
RS-232 Cable (ECM25C), p. 83
Minimum Length: 5 ft. (1.5 m)
Minimum Length: 5 ft. (1.5 m)
Opto-Isolator (SP400A-R2)

SPECIFICATIONS

Protocol — Asynchronous

Interface — SP340A, SP400A-R2: RS-232; SP402A, SP401A: RS-422/485

Speed — SP340A: Serial data rates up to 115.2 Kbps; SP400A-R2: Up to 9600 bps (when powered); SP402A, SP401A: Up to 19.2 Kbps

CE Approval — SP340A, SP400A-R2; PS015E (230-VAC version)

Connectors — SP340A, SP400A-R2: (2) DB25 female; SP402A: (1) 4-screw terminal; SP401A: (2) RJ-45

Power — SP340A: From the interface or optional 9-VDC/200 mA wallmount supply; SP400A-R2: From data and control signals; optional 115-VAC transformer provides 9 VDC to drive signals on one side of the line; SP402A, SP401A: From the Receive data pair

Size — SP340A, SP400A-R2: 1"H x 3"W x 4"D (2.5 x 7.6 x 10.2 cm); SP402A, SP401A: 1"H x 2.3"W x 2.3"D (2.5 x 5.8 x 5.8 cm)

Weight — SP400A-R2, SP340A: 0.8 lb. (0.4 kg); SP402A, SP401A: 0.1 lb. (<0.1 kg)

Item	Code	Price
High-Speed Opto-Isolator	SP340A	**$164.00**
Opto-Isolator	SP400A-R2	**$149.00**
9-VDC Power Supply (for SP400A-R2 Only)	PS015	**$12.00**
Opto-Isolator II	SP402A	**$129.00**
RS-422/RS-485 Opto-Isolator	SP401A	**$129.00**

remember to order **cables**

For SP340A and SP400A:

RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83. Specify gender when ordering.

For SP401A and SP402A: Call Tech Support to be sure you order the right cable.

Data Isolators

Stop Interference—Get Transformer Isolation.

- **Provides 2500-volt isolation between two RS-232, RS-422, or TTL devices.**
- **High-speed models support today's super-fast DTEs.**
- **Special Converter models also available.**

These Data Isolators from Black Box provide 2500-volt signal-ground isolation protection between two connected RS-232, RS-422, or TTL devices. Models are also available to provide interface conversion from RS-232 to RS-422 or TTL. Use any of the Isolators for outdoor runs or other applications that may produce ground loops or other interference problems.

RS-232 Data Isolator (SP403A)
RS-232 Cable (ECM25C), p. 83
Terminal
Async Host
EXCLUSIVE
BLACK BOX® (412) 746-5500
INPUT
DCE S1
DTE S2
HIGH SPEED RS-232 DATA ISOLATOR
OUTPUT

SPECIFICATIONS

Maximum Data Rate — SP403A, SP405A, SP407A, IC106A, IC104A: 19.2 Kbps; SP404A, SP406A-R2, SP408A, IC105A, IC103A: 200 Kbps

Interface — SP403A-SP404A: RS-232; SP405A-SP406A-R2: RS-422; SP407A-SP408A: TTL; IC105A-IC106A: RS-232, RS-422; IC103A-IC104A: RS-232, TTL

Connectors — All models: (2) DB25 female

Indicators — (2) Power On LEDs

Power — 115 VAC, 60 Hz or 230 VAC, 50 Hz

Size — 1.8"H x 8"W x 6.3"D (4.6 x 20 x 16 cm)

Weight — 2 lb. (0.9 kg)

FAXBACK INFORMATION
Request Document Number: 13332
Call 412-746-5500 Anytime

Item	Code	Price
RS-232 Data Isolator	SP403A	**$249.00**
High-Speed RS-232 Data Isolator	SP404A	**$349.00**
RS-422 Data Isolator	SP405A-R2	**$299.00**
High-Speed RS-422 Data Isolator	SP406A-R2	**$399.00**
TTL Data Isolator	SP407A	**$219.00**
High-Speed TTL Data Isolator	SP408A	**$229.00**
RS-232↔RS-422 Isolator	IC106A-R2	**$329.00**
High-Speed RS-232↔RS-422 Isolator	IC105A-R2	**$419.00**
RS-232↔TTL Isolator	IC104A	**$269.00**
High-Speed RS-232↔TTL Isolator	IC103A	**$299.00**

remember to order **cables**

RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83. Specify gender when ordering.

PentaScanners—The Ultimate in CAT5™

- **The most accurate handheld field cable testers available.**
- **Exceeds all accuracy requirements for TSB-67 Level II field testers.**
- **Certify 200 cable types and store up to 500 autotests.**
- **Simultaneously analyze and certify multiple network types.**
- **Choose from three PentaScanner models.**

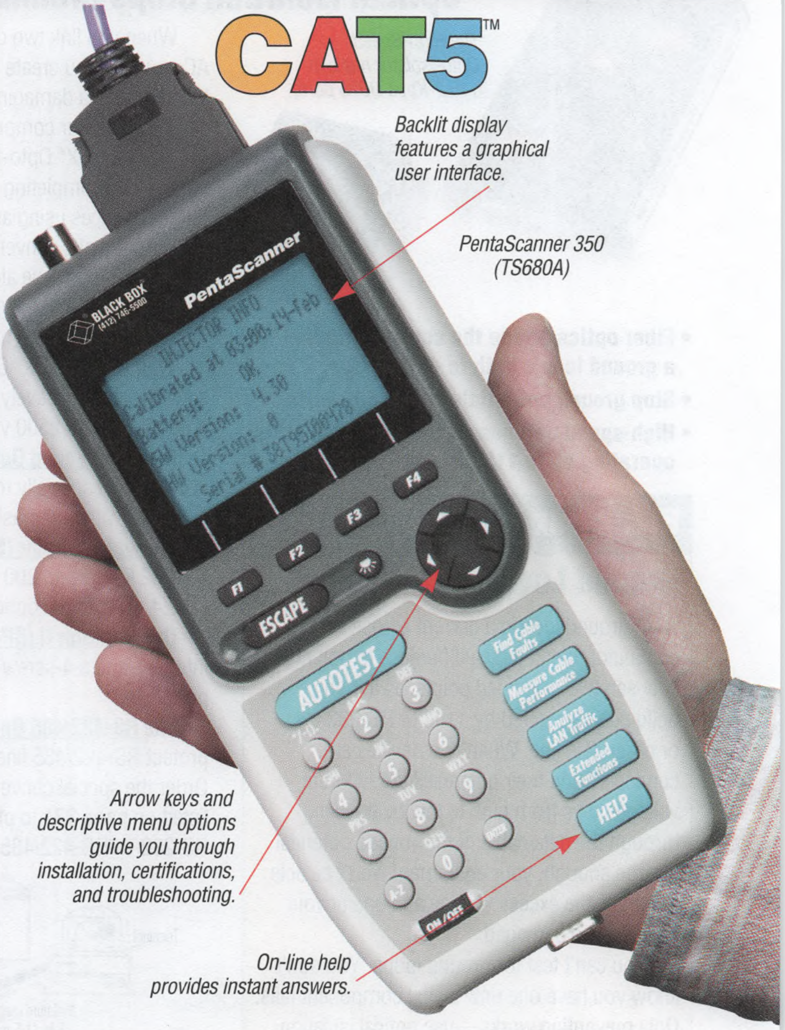
We've expanded our popular PentaScanner into a complete line of precise kits for certifying and maintaining Category 5 cable installations. These PentaScanner+ models, including the PentaScanner 350 with performance grading, are the ultimate solutions for quick, reliable network cable testing by cable installers, service providers, and network managers.

All PentaScanners feature user-selectable cable grading and exceed minimum accuracy performance requirements for the EIA-568A spec. And they offer the most accurate 100-MHz test system available. There's no faster way to certify and maintain Category 5 and ISO Class D cabling systems.

Use the PentaScanners to test UTP, coax, and STP cable. Perform comprehensive one-step autotests with date and time stamp.

The 2-Way Injector+ gives the PentaScanners an extra margin of accuracy, speed, and reliability.

Each PentaScanner features a comprehensive library of 200 programmable cable types. With a single keystroke, you'll know if a network supports 10BASE-T, 4/16 Mbps Token Ring, ARCNET®, ISDN, AppleTalk®, T1, 100BASE-VG, Fast Ethernet, ATM155 Mbps, and more.



Backlit display features a graphical user interface.

PentaScanner 350 (TS680A)

Arrow keys and descriptive menu options guide you through installation, certifications, and troubleshooting.

On-line help provides instant answers.

SPECIFICATIONS

Attenuation — Frequency range: 0.512 to 100 MHz;
Dynamic range: -50 to 0 dB
Capacitance — 0 to 100,000 pF
Distance — Twisted pair: 0–3000 ft. (0–915 m);
Coax: 0–4000 ft. (0–1220 m)
Impedance — Range: 40 to 200 ohms;
Accuracy: ±5 ohms;
Resolution: 2 ohms
Loop Resistance — 0 to 1000 ohms
NEXT — 0.7–100-MHz frequency range
CE Approval — All items listed are approved
Connectors — Measurement: BNC, shielded RJ-45;
Serial: (1) DB9 female
Power — 9.6 volts @ 1200 mA-hr rechargeable battery pack;
Battery life: 8 hours' daily operation, 6 hours in continuous autotest
Size — 4"H x 8"W x 2.2"D (10.2 x 20.3 x 5.5 cm)
Weight — 1.1 lb. (0.8 kg)

FOR COMPARISON: PentaScanners

Features	Penta Scanner 350	Penta Scanner+	Penta Scanner 2-Way+
Tests Category 5 Cable	✔	✔	✔
Tests All Types of Twisted-Pair and Coax Cables	✔	✔	✔
Scan Test (Cable Length/Distance to Fault)	✔	✔	✔
Performance Cable-Grading	✔		
NEXT at Both Ends of Link			✔
TSB 67 Compliant		✔	✔
Continuity Test	✔	✔	✔
Ethernet Network Monitor	✔	✔	✔
Toggles between Feet and Meters	✔	✔	✔
Backlit LCD Graphical User Display	✔	✔	✔
Library of Most Cable Types	✔	✔	✔
Noise Tests	✔	✔	✔
Finds Unknown Characteristics	✔	✔	✔
Resistance Test	✔	✔	✔
Data Library	✔	✔	✔
Network Monitor Printout			✔
Print through RS-232 Port	✔	✔	✔
AC or Rechargeable Battery	✔	✔	✔
Detects Miswiring (Inverted Pairs)	✔	✔	✔
Impulse Noise Test	✔	✔	✔

Features	Penta Scanner 350	Penta Scanner+	Penta Scanner 2-Way+
Hub Activation (10BASE-T)	✔	✔	✔
Signal Loss for 10BASE-T	✔	✔	✔
Automatic Power-Down	✔	✔	✔
Tests 16- and 4-Mbps Token Ring	✔	✔	✔
Tests Compliance with 10BASE-T	✔	✔	✔
Autotest Performs Tests Instantly	✔	✔	✔
User-Definable Tests and Pairs in Autotest	✔	✔	✔
Measures Near-End Crosstalk (NEXT)	✔	✔	✔
Plots NEXT in High-Resolution and Attenuation Results	✔	✔	✔
CSV Output	✔	✔	✔
Certifies for Multimedia	✔	✔	✔
Pass/Fail Indication	✔	✔	✔
Stores Autotest Results	✔	✔	✔
Tests All Four Pairs	✔	✔	✔
Signal Loss for Token Ring	✔	✔	✔
10BASE-T Network Monitor	✔	✔	✔
Flash ROM for Remote Software Upgrades	✔	✔	✔
Detects Split Pairs	✔	✔	✔
Office Locator	✔	✔	✔

In This Section...
Surge Protectors
Line Conditioners
Data-Line Protection
Optical Isolation

Category 5 Cable Testers.

Category 5 Testing with Performance Grading

PentaScanner 350 with 2-Way Injector+

The Standard for LAN Cable Testing.

Future-Proof Your Category 5 Cabling with Performance Grading.

- **Performance grading focuses on link quality for high-speed applications.**
- **Test up to 100 MHz on 350-MHz cable.**
- **Tests headroom above standard Category 5 cable.**
- **Ideal for contractors, cable installers, and LAN administrators.**
- **Runs an error-free autotest in only 21 seconds.**
- **2-Way Injector provides 2-way NEXT testing.**

Demand for high-speed Category 5 cable testing increases every day. With our PentaScanner™ 350, you're ready. It's the only Category 5 cable tester with performance grading so you can use it today—and for years to come as cable requirements change.

Test 350-MHz cable for superior link quality. Performance grading measures and rates the quality of high-performance links by analyzing the headroom available for future high-speed applications. And you'll get more than just pass/fail results. PentaScanner 350 differentiates between marginally passing links to those with up to 70 times better signal-to-noise ratios. You'll know if your cable links need to be rewired or if they support new high-speed applications.

The PentaScanner 350 offers the most accurate measurement system available with the 2-Way Injector$^+$ and 350-MHz Performance Grading in one kit.

If you already own a PentaScanner$^+$ 2-Way (TS660A-R2), it's easy to upgrade to PentaScanner 350. Just buy the PentaScanner 350 Upgrade Kit (TS685A).

What's in the PentaScanner 350 Kit:

- PentaScanner 350
- 2-Way Injector$^+$
- (2) Adapter cables
- (2) Mod 8 adapters
- (1) Serial cable
- (2) AC adapters
- Operator's guide
- (2) Replaceable, rechargeable batteries
- Power Supply
- Case

FAXBACK INFO
Request Document Number: 17161
Call 412-746-5500
Anytime

PentaScanner 350 (TS680A)

2-Way Injector+

Test 350-MHz Cable!

Item	Code	Price
PentaScanner 350 with 2-Way Injector+	TS680A	**$4795.00**
PentaScanner 350 Upgrade Kit (for the PentaScanner 2-Way+ TS660A-R2)	TS685A	**$495.00**

PentaScanner$^+$ Kit

Accurate One-Way Channel and Basic Link Testing.

- Performs NEXT and ACR tests from one end of the cable link.
- Certify installed Category 5 links to TSB-67 Level II accuracy.
- Ideal for cable contractors, field service providers, and LAN administrators.
- Test any copper cable, even coax.

Upgrade Your Existing PentaScanner!

PentaScanner$^+$ Kit includes the PentaScanner$^+$ and the SuperInjector$^+$ (TS640A-R2).

What's in the PentaScanner$^+$ Kit:

- PentaScanner$^+$
- Super Injector$^+$
- (2) Patch cables
- (2) Mod 8 adapters
- (1) Serial cable
- Operator's guide
- Replaceable, rechargeable battery
- Power supply
- Case

Item	Code	Price
PentaScanner$^+$ Kit	TS640A-R2	**$3495.00**
Adapter Kits		
Twinax	TS383	**$45.00**
Unterminated Cable	TS331	**$45.00**
RJ-45 F-F Couplers		
Shielded	TS645	**$25.00**
Unshielded	TS646	**$25.00**
PentaScanner$^+$ Battery Pack	TS644	**$170.00**

PentaScanner 2-Way$^+$ and 2-Way Injector$^+$

Accurate Two-Way Channel and Basic Link Testing.

- **Performs NEXT and ACR tests on both ends of the cable link—all from one end.**
- **Certify installed Category 5 links to TSB-67 Level II accuracy.**
- **Designed for cable contractors, field service providers, and LAN adminstrators.**

TECH SUPPORT'S PRODUCT OF CHOICE

Test Near-End Crosstalk (NEXT) and Attenuation-to-Crosstalk Ratio (ACR) on both the wiring closet and workstation ends of an installed link—from one end of the link! Just plug the PentaScanner 2-Way$^+$ and 2-Way Injector$^+$ into each end of the link and press Autotest.

FAXBACK INFO
Request Document Number: 13655
Call 412-746-5500
Anytime

Item	Code	Price
PentaScanner 2-Way$^+$	TS660A-R2	**$4595.00**
2-Way Injector$^+$	TS661A-R2	**$1595.00**

What's in the PentaScanner 2-Way$^+$ Kit:

- PentaScanner 2-Way$^+$
- 2-Way Injector$^+$
- (2) Adapter cables
- (2) Mod 8 adapters
- (1) Serial cable
- (2) AC adapters
- Operator's guide
- Replaceable, rechargeable battery
- Power supply
- Case

MicroScanner

Give Each Member of Your Crew a Scanner.

The MicroScanner Does a Lot for Less.

- **Verify and troubleshoot twisted-pair cable.**
- **Checks continuity and wiring configurations.**
- **Displays cable lengths and pinouts.**
- **Pinpoints opens, shorts, and crossed and split pairs.**
- **Measures length, including individual pair lengths.**
- **Generates tone for locating hidden cables.**
- **Matches cables to offices during additions, moves, and changes.**

The Basic Unit Includes:

- MicroScanner
- Wire-Map Adapter
- 9-V Alkaline Battery
- Pocket-Sized User's Guide

Optional Accessories:

- Carry Case and 12 Office Identifiers

Pocket-Sized

MicroScanner—the essential cable checker for every twisted-pair cable contractor, installer, and technician.

Here's the solution for faster cable installations and troubleshooting—the MicroScanner™. In the past, only supervisors checked cables because of the high cost of testers. Not anymore. The MicroScanner is so affordably priced, every member of the crew should have one.

When you're installing cables, you don't have the time to fumble with a lot of different equipment. You want answers and you want them fast. Get them with the MicroScanner. You'll get extensive cable verification and troubleshooting information at a glance—all from a unit small enough to fit in your pocket.

The MicroScanner is the first low-cost cable tester designed for cable installers, electrical contractors, and LAN administrators. It verifies and troubleshoots newly installed cables, confirms continuity and wiring, and locates cable faults. The MicroScanner is ideal for those who aren't performing cable certification but still need cable verification.

The wiremap function checks to see if your 10BASE-T, Token Ring, or other twisted-pair cabling is wired properly. If it isn't, the MicroScanner will identify the problem and locate the faulty pair. It pinpoints opens, shorts, and reversed or crossed and split pairs.

The length function measures all four pairs and displays the results in feet or meters. It also determines whether the cable is open or shorted.

You can easily tell the length of an individual pair and whether the cable is connected to a hub. For accuracy, the MicroScanner uses Time Domain Reflectometry (TDR) for measurements. It can be calibrated to a cable's Nominal Velocity of Propagation (NVP).

Find cables quickly. The MicroScanner generates four distinct tones for tracing cables hidden in walls, ceilings, floors, or wiring closets.

Simplify cable additions, moves, and changes with the Office Identifier. It locates the termination of an office cable drop in a wiring closet—so you don't have to search for unmarked cable. Just insert the Office Identifier adapters into the office wall outlet. The MicroScanner then identifies the office locations at the patch panel.

A handy low-battery indicator warns you when the power is running low.

MICROSCANNER
WIREMAP
123 6
123 6
ON/OFF
MODE
BLACK BOX
(412) 746-5500

The wiremap function verifies that your twisted pair cable is wired properly. If not, the MicroScanner™ identifies the problem, the faulty pair, and the split pairs.

SPECIFICATIONS

Length Calibration — Minimum length: 50 feet (15.2 m);
Maximum length: 1500 feet (457 m)
Interface — Main: modular-8 connector for length, wiremap, office identifier, and toner;
Loopback: modular-8 connector for patch cable wiremap
CE Approval — All items listed are approved
Connectors — (2) RJ-45 jacks (shielded)
Indicators — (1) LCD display, 1.8"H x 0.9"W (4.6 x 2.3 cm); (1) LED, low-battery
Power — 9-volt alkaline battery
Size — 5.5"H x 3.3"W x 1"D (14 x 8.4 x 2.5 cm)
Weight — Entire package: 3 lb. (1.4 kg)

BUYER'S GUIDE

FOR COMPARISON: MicroScanner

Features	MicroScanner	Competitors				
		A	B	C	D	E
Using Length TDR	✓					
Wiremap Display on LDC	✓	✓	✓	✓	✓	✓
Split-Pair Identification	✓	✓	✓			✓
Office Identification	✓	✓	✓		✓	
Toner with 4 Distinct Tones	✓			✓	✓	✓
High-Voltage Protection	✓	✓	✓	✓	✓	✓
Auto-Shutoff	✓	✓			✓	
Low-Battery Indicator	✓	✓	✓		✓	
Two RJ-45 Jacks	✓					
Price	$399.95	$395.00	$359.00	$259.00	$595.00	$495.00

FAXBACK INFORMATION
Request Document Number: 17336
Call 412-746-5500 Anytime

Item	Code	Price
MicroScanner	TS800A	$399.95
Carry Case and 12 Office Identifiers	TS801	$299.00

SCAN-LAN V Two-Way • SCAN-LAN Vt • FIBERoptic Performance Module

Certify Category 5 Plus with Power Sum!

Talk over the Test Link *and* Test Fiber!

SCAN-LAN V Two-Way • SCAN-LAN Vt:

- **Test enhanced Category 5 cable, including Power Sum NEXT (PS-NEXT) and cable grading.**
- **Two-way Testers enable testing from both cable ends.**
- **Provides full graphic displays of test results at both the main and remote site.**
- **Certifies cable up to 100 MHz. Fully compliant with Level II TSB-67.**
- **Stores up to 1000 tests in memory. Download results later to a PC or printer.**
- **AutoTest provides one-step testing.**
- **Tests all major cable and network standards, including 100-Mbps Ethernet and ATM 155 Mbps.**
- **Plug-in Performance Modules give you the flexibility to test various cables on the fly.**

***Plus,* SCAN-LAN Vt features:** *New*

- **Offers built-in two-way talk set so you and your partner can talk over the test link.**
- **Works in buildings where surrounding steel causes garbled 2-way radio communications.**
- **Includes built-in microphones, earphones, and volume controls.**

***Plus,* FIBERoptic Performance Module features:**

- **Turns your SCAN-LAN into a copper/fiber tester.**
- **Analyzes and tests fiberoptic cable at three wavelengths: 850, 1200, and 1500 nm.**

Preferred by cable contractors and installers for full Category 5 cable certification, SCAN-LAN V Two-Way and SCAN-LAN Vt provide you with more precise measurements, more reliability, and greater ease of use at a lower cost than other Category 5 cable testers.

Certify Enhanced Category 5 cable and quantify crosstalk headroom with Power Sum NEXT (PS-NEXT) measurements and Cable Grading. PS-NEXT assures that links will support four-pair active networks, such as ATM 622 Mbps and Gigabit Ethernet.

Certify your LAN cable with guaranteed accuracy exceeding TIA TSB-67 Level II requirements. Test all TSB-67 parameters: wiremap, length via TDR, NEXT, and attenuation. Matching Tester units enable you and a partner to perform automatic bidirectional NEXT measurements for both basic link and channel testing. Detailed test results, including graphs, appear on both LCDs.

Both Basic Link and Channel test configurations can be tested per TSB-67 without external adapters that can introduce errors. Plug-in Performance Modules provide an optimal interface to the link and minimize measurement error. They also enable easy connections to 110 blocks BIX blocks, ALL-LAN (mini-C) jacks, coax, and fiberoptic cable.

Both Units perform full master or remote functions interchangeably. You specify which by setting the front dial to Remote.

Plug-in the FIBERoptic Performance Module and turn your SCAN-LAN into a fiber tester.

SCAN-LAN Test Functions:

- Wire Map (4-pair and shield)
- Length
- NEXT
- Power Sum NEXT (Older models can be upgraded.)
- Impulse Noise
- Attenuation and Attenuation-to-Crosstalk Ratio (ACR)
- Propagation Delay
- Propagation Delay Skew
- Characteristic Impedance
- Impedance Anomalies
- Resistance
- Pair Reversal Test*
- Repeatability Test*
- Ethernet Traffic: Utilization, Collisions

* TSB-67 consistency checks.

Each SCAN-LAN V Two-Way and Vt Includes:

- (2) Two-Way Tester Units
- (2) RJ-45 Modular Plug Performance Modules
- (1) Set of 16 Alkaline Batteries
- (1) PC Interface Cable
- Field-Calibration Standard
- 120-VAC Power Adapter
- Easy-to-Read User's Manual
- Durable Nylon Carrying Case

FAXBACK INFORMATION
Request Document Number: 14577
Call 412-746-5500 Anytime

PLUS! Power Sum Upgrade
HOT NEW PRODUCTS

New Power Sum Testing
SCAN-LAN Vt
SCAN-LAN V TwoWay
BLACK BOX

SCAN-LAN Vt (TS699A)

SCAN-LAN Two-Way (TS690A)

SPECIFICATIONS

SCAN-LAN Two-Way/SCAN-LAN Vt:

Controls — (10) pushbutton function/control keys; 10-position Test-Selector dial
CE Approval — 230-VAC, 50-Hz model: TS690AE
Connectors — (1) DB9 male RS-232 port, (2) RJ-45 female Modules;
Optional Modules: (1) RJ-45 female, (1) RJ-45 male, or (1) BNC
Indicators — Alphanumeric/graphic LCD window
Power — 120-VAC, 60-Hz charger, or 16 AA alkaline batteries, Ni/MH rechargeable battery pack (order separately)
Size — 9.8"H x 3.8"W x 2.3"D (24.9 x 9.7 x 5.8 cm)
Weight — 1.9 lb. (0.9 kg)

FIBERoptic Light Source:

Output — > -20 dBm
Source — LED
Wavelengths — 850, 1300 nm
CE Approval — TS696A–TS698A
Connectors — (2) ST
Power — (1) 9-V battery
Size — 3.8"H x 2.4"W x 1"D (9.7 x 6.1 x 2.5 cm)
Weight — 0.3 lb (0.1 kg)

FIBERoptic Performance Module:

Accuracy — ±0.2 dB
Range — +3 to -55 dB/m
Resolution — 0.1 dB
Wavelengths — 850, 1300, 1550 nm
CE Approval — TS696A–TS698A
Connectors — (1) ST®
Power — From SCAN-LAN V
Size — Fits inside SCAN-LAN V
Weight — <1 lb. (< 0.5 kg)

Item	Code	Price
SCAN-LAN V Two-Way	TS690A	**$3995.00**
SCAN-LAN Vt	TS699A	**$4395.00**
Optional Performance Modules		
Modular Plug	TS691	**$175.00**
Modular Jack	TS692	**$175.00**
Coax Module	TS693	**$130.00**
FIBERoptic Kit (Performance Module and Light Source)	TS698A	**$1495.00**
FIBERoptic Performance Module	TS696A	**$695.00**
FIBERoptic Light Source	TS697A	**$895.00**
Battery Pack (Ni/MH)	TS694	**$160.00**
Extra Carrying Case	TS695	**$124.00**

Black Box Explains...

System Verification.

System Verification means documenting and managing your system. You should always test your network thoroughly and maintain detailed written documentation.

Documentation

System Verification begins at installation. Even the smallest systems need to be documented as they're installed so that records are available when those systems are modified. Record cable type and network topology. Make a wiring map of all connections and endpoints, as well as the locations of network hardware—repeaters, bridges, hubs, and concentrators.

You also should include information about the network's limitations—the maximum number of nodes, maximum and minimum cable lengths, and other specifications.

Check the play in all mechanical connectors to ensure good contact. Also be aware of the locations of all AC power lines, motors, transformers, and fluorescent lights, and route cable around their electromagnetic fields.

Testing

When you install a system, check the integrity of the new cable twice—once on the spool for the entire cable length, and once along each segment after installation to check for stresses that might have damaged the cable during installation.

Check cable on the spool with a Time-Domain Reflectometer (TDR) test, which sends a fast rise-time pulse down a cable and measures the intensity of reflections. The greatest reflection indicates the end of the unterminated cable. Reflections appearing too soon could indicate changes in crimping, stretching, corrosion, or breaks in shielding, among other defects. TDR testing is particularly useful for cable that's already in place to detect bad vampire taps, changes in cable type, pair splits, and other problems.

Testing an existing system can be the most challenging task for any system administrator—especially if the system is inadequately documented.

An added problem is that Unshielded Twisted-Pair (UTP) cable plants installed before July 1991 were not subject to EIA/TIA standards. Since its performance is unknown, you should test preinstalled cable for suitability as a LAN medium.

Basic, Midrange, or Professional

SCAN-LAN 80, SCAN-LAN 150, SCAN-LAN 180 Cable Scanners

BLACK BOX
BLACK BOX
BLACK BOX
ON/OFF
CABLE
SAVE
AUTOTEST
WIRE MAP
NOISE
LENGTH
TRAFFIC
PRINT
CUSTOM CABLE
CALIBRATE CABLE
SPECIAL SETUP
EXTENDED FUNCTIONS
SCAN-LAN 180
SCAN-LAN 150
SCAN-LAN 80

A Cable Scanner for every test level. Left to right: SCAN-LAN 80, SCAN-LAN 150, SCAN-LAN 180.

Whether your cable-testing needs are basic or advanced, Black Box is your source for solutions. We're the Cable Experts. We've made cable testing easy, quick, and affordable for every level of complexity.

The **SCAN-LAN 80** offers Autotest to run most common testing procedures automatically. Use Custom Setup to change factory-set values or Default to restore them.

The **SCAN-LAN 150** has the same features with more memory and printing capabilities.

The **SCAN-LAN 180** has additional testing power for the most advanced jobs. Store more parameters in memory, attach an oscilloscope, and define custom cable parameters.

See the **next page** for more information.

The SCAN-LAN 180 Kit (right) provides professional cable scanning at a very affordable price.

SPECIFICATIONS

SCAN-LAN 80:

Display — 4-line LCD with 16 characters per line
Function Select — 7-position rotary switch, (4) pushbuttons: ON/OFF, Scroll Up, Scroll Down, Save
CE Approval — TS624A
Connectors — RJ-45 and BNC
Power — (2) 9-volt alkaline batteries
Size — 7.8"H x 3.9"W x 1.5"D (20 x 10 x 3.8 cm)
Weight — 1.1 lb. (0.5 kg)

SCAN-LAN 150 and SCAN-LAN 180:

Display — 4-line LCD with 16 characters per line
Function Select — 10-position rotary switch; (4) pushbuttons: ON/OFF, Scroll Up, Scroll Down, Save
CE Approval — 230-VAC, 50-Hz versions: TS625AE, TS630AE
Connectors — RJ-45 and BNC
Power — (2) 9-volt alkaline batteries, 115-VAC (9-VDC, 300-mA) adapter, (230-VAC version on request)
Size — 7.6"H x 4"W x 1.7"D (19.3 x 10.2 x 4.3 cm)
Weight — 1.2 lb. (0.5 kg)

BUYER'S GUIDE

WHAT'S IN THE SCAN-LAN KITS:

	SCAN-LAN 80	SCAN-LAN 150	SCAN-LAN 180
The Scanner	✓	✓	✓
Remote Unit for 10BASE-T	✓	✓	✓
AC Adapter		✓	✓
(1) BNC Cable		✓	✓
(1) 50-Ohm Terminator		✓	✓
(1) BNC T Adapter		✓	✓
(1) Printer Cable		✓	✓
(1) RJ-45 F/F Coupler		✓	
RJ-45 to Clip-Lead Cables		(1)	(2)
RJ-45 Patch Cables		(2)	(2)
(2) RJ-45 M/F Strain-Relief Cables		✓	
Batteries	(3) (2 in Tester, 1 in Remote Unit)	(6) (2 in Tester, 1 in Remote Unit, 3 spare)	(6) (2 in Tester, 1 in Remote Unit, 3 spare)
User's Manual	✓	✓	✓
Carrying Case		✓	✓

Cable Testing—Black Box Has the Scanner for Every LAN.

SCAN-LAN 80 Cable Scanner

Cable Scanning for under $900!

- **Test 4- and 16-Mbps Token Ring or Ethernet networks.**
- **Full diagnostics—Autotest, Wiremap, Length, Noise, Traffic, Calibrate, and Special Function.**
- **Four-line LCD with 16 characters per line.**

Troubleshooters: Here's a basic Cable Scanner that's comprehensive, easy to operate, *and* affordable.

For cable problems, select Autotest Mode. The BLACK BOX® SCAN-LAN 80 checks cable background noise, wiremap, NEXT, attenuation, length, and impedance—automatically. There are special functions, too. You can change length, fault, and thresholds with Custom Setup.

SCAN-LAN compares its results against the IEEE 802 specification and gives you a Pass or Fail indication. If a cable failed any test, you find out which one with exact, measured results.

Testing with SCAN-LAN 80 is easy—just select Autotest with the front-panel dial. SCAN-LAN 80 does the rest. Or select individual tests: wiremap, length, noise, or traffic. Test results appear on the LCD. Two 9-volt batteries power the unit for eight hours.

SCAN-LAN 150 Cable Scanner

All the features of the SCAN-LAN 80, plus:

- **Store up to 50 test results in RAM.**
- **Print test results.**
- **AC Adapter.**

With the BLACK BOX® SCAN-LAN 150 Cable Scanner you get complete scanning functions *plus* the ability to store up to 50 test results in RAM to print out later.

For automatic testing of new and existing LAN wiring, just plug the SCAN-LAN 150 Cable Scanner into a cable and select the cable type. Autotest does the rest.

One Scanner's enough to run full cable qualifications for RG58, RG59, RG62, 10BASE-T, and up to four custom cable definitions.

It offers TDR, near-end crosstalk (NEXT), and attenuation—three of the most needed and popular testing functions—in one compact tester.

A simple 10-position rotary dial makes it easy to select the test you want. You don't have to deal with multiple menu layers.

A four-line LCD display shows live LAN reactions including collision and jabber reports and a bar graph for traffic.

You get a hard-copy record of testing results. Up to 50 test results can be stored as test reports for external printing on any serial printer.

The SCAN-LAN 150 features two 8-hour batteries plus a low-battery indicator and automatic power-down.

SCAN-LAN 180 Cable Scanner

All the features of the SCAN-LAN 150 plus:

- **Store up to 500 test results in RAM.**
- **Attach an oscilloscope for detailed examination of test results.**

This sophisticated but still affordable Cable Scanner is perfect for comprehensive testing of large installations. You get all the functions of our other SCAN-LAN testers plus extra features for the cable professional.

You can store up to 500 test results in RAM, then print them later for detailed review.

The BLACK BOX® SCAN-LAN 180 also features O-Scope Mode—attach an oscilloscope and examine your test results in detail while you troubleshoot.

You can also define nominal velocity of propagation, characteristic impedance, and connector type for two custom cables, and store them in memory for later tests.

Testing is automatic—attach your cable, then set the center dial for instant readings. SCAN-LAN 180 is preset to measure cables per EIA/TIA 568, and IEEE 802.3 and 802.5 specifications.

Item	**Code**	**Price**
SCAN-LAN Cable Scanners		
80	TS624A	**$895.00**
150	TS625A	**$1595.00**
180	TS630A	**$2195.00**
To test Token Ring Type 1 with Data Connectors, you'll also need:		
Token Ring Kit	TS631	**$89.00**

◆ ◆ ◆

LOCALMAP 100 Cable Tester

Identify All Your 10BASE-T Cabling Faults with This Inexpensive Scanner.

- **Identify 10BASE-T wiring problems.**

The LOCALMAP 100 Cable Tester checks for all possible 10BASE-T wiring faults—open pairs, shorted pairs, crossed pairs, reversed pairs, and split pairs.

Operation's as simple as pressing a button. Just plug a remote unit (included) into a wall jack and attach your LOCALMAP 100 to the other end of the cable. When you press the Start button, the unit automatically runs all tests and displays the results. Red or green LEDs indicate whether pairs are wired correctly.

One person can verify or identify up to eight individual cables. All you need are additional remote units—and they're numbered for easy identification.

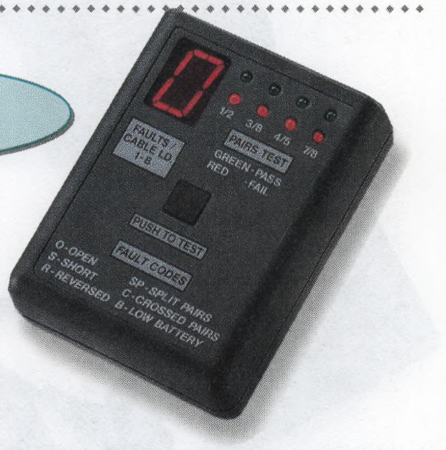
The Identifier Kit 234 adds three remote units to the one already included with LOCALMAP 100, so you can test up to four cable runs. The Identifier Kit 5678 adds four more remote units for a total of eight: You can test up to eight cable runs.

NOTE: An optional carrying case holds your LOCALMAP 100 Cable Tester and up to eight remote units.

SPECIFICATIONS

Cable Length — Up to 100 m (328 ft.)
CE Approval — TS620A
Connectors — (1) RJ-45
Indicators — (8) LEDs: (4) Red, (4) Green; (1) Single-digit 16-segment display
Power — TS620A: (1) 9-V alkaline battery; Remote units: None
Size — TS620A: 1.3"H x 2.8"W x 3.7"D (3.3 x 7.1 x 9.4 cm); Remote units: 0.5"H x 1.1"W x 2.4"D (1.3 x 2.8 x 6.1 cm)
Weight — TS620A: 0.4 lb. (0.2 kg); Remote units: <0.1 lb. (<0.1 kg)

MORE! Cable Scanners, **see pp. 196–199.**



F A X B A C K I N F O R M A T I O N
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Item	**Code**	**Price**
LOCALMAP 100 Cable Tester	TS620A	**$379.00**
Identifier Kit		
234	TS621	**$119.00**
5678	TS622	**$159.00**
LOCALMAP 100 Carry Case	TS623	**$15.00**

T1 Link Channel Tester

Test and Analyze T1 Equipment and Circuits—Remotely.

- **Automatic configuration and testing enables unattended remote testing.**
- **In-service monitoring detects line problems on networks carrying traffic.**
- **Out-of-service BERT testing for CSU and terminal troubleshooting.**
- **With a channel drop speaker, VF jack, level meter, and signal LEDs, you can monitor traffic levels and frequency without disrupting the network.**
- **Referenced clock and frame-slip measurement preserves data and voice WAN communication.**
- **Run remote loopbacks with regenerative loopback/CSU emulation.**

Attention installers of muxes, CSUs, PBXs, and other premise equipment: Here's a new tester just for you. Now you can analyze line quality—remotely. Just turn on the T1 Link Channel Tester and leave it unattended at a remote site. You can completely control the Tester from any other T1 test set without any additional control link. The T1 Channel Link Tester will automatically configure to the received signal.

Use the T1 Link Channel Tester to determine line quality. It can track signal voids by calculating peak and one-second bit-error rates and signal-loss seconds. You can also detect clock and framing slips caused by asynchronization, jitter, and wander.

You can also use the Tester to analyze T1 circuits when you suspect communication problems are caused by failing lines.

The Tester includes: remote control, BERT pattern detection, BERT pattern generation, clock slip measurement, bridge tap/multipattern test, 9-V batteries, manual, and carrying case.

SPECIFICATIONS

Connectors — (1) DB25
Display — 2 x 16 character
Power — (4) 9-V batteries, or external 115-VAC, 60 Hz external AC power supply (included)
Size — 10.9"H x 6"W x 3.4"D (28 x 15.2 x 8.6 cm)
Weight — 3 lb. (1.4 kg)

FAXBACK INFORMATION
Request Document Number: 18650
Call 412-746-5500 Anytime

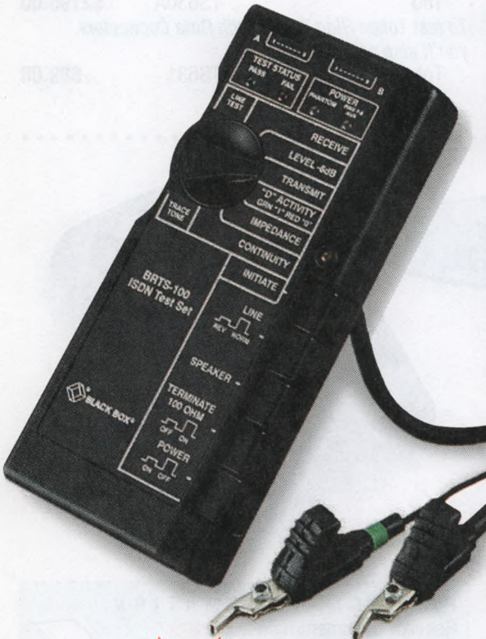
New
BLACK BOX
Exbert T1 Monitor

Item	Code	Price
T1 Link Channel Tester	TS900A	**$3499.95**
Bantam Alligator Cable	TS901	**$54.95**
Bantam 310 Cable	TS902	**$54.95**
Bantam–Bantam Cable	TS903	**$54.95**

◆ ◆ ◆

ISDN Test Set

Locate Faults Fast on ISDN Equipment—without Calling in an Expert.



Back by Popular Demand!

- **Fast, simple operation for basic ISDN troubleshooting.**
- **Pass/fail LEDs give instanteous results.**
- **Selectable range of go/no go tests for common installation problems.**
- **Compatible with ITU standards.**

Trouble with your ISDN line? Use this compact, handheld tester to identify the problem—even if you're not an expert. And you'll get instant test results with Pass/Fail LEDs.

With the ISDN Test Set, you can check the continuity of ISDN physical connections and isolate faulty elements in an ISDN network.

The ISDN Test Set performs comprehensive tests such as: battery presence, DC continuity, signal level, D-channel synchronization, physical-layer parameters, and more. The Tester can even verify continuity from the terminal device to the CO switch. And by sampling every frame, intermittent problems, like jitter, can be detected.

This Test Set is fully compatible with the ITU-TSS I.430 standard.

SPECIFICATIONS

Operation Modes — Line Test, Receive, Level, Transmit, Monitor, Termination, DC continuity
Approvals — FCC Parts 68 and 15
Connectors — (2) RJ-48
Power — 9-volt battery
Size — 7.3"H x 3.3"W x 1.1"D (18.5 x 8.4 x 2.8 cm)
Weight — 1 lb. (0.5 kg)

Item	Code	Price
ISDN Test Set	TS675A	**$895.00**

In This Section...
Surge Protectors
Line Conditioners
Data-Line Protection
Optical Isolation

Modular Testers

Test Your Modular and Premise Wiring.

- **Works with all USOC-wired cables that use 4-, 6-, or 8-position modular connectors.**

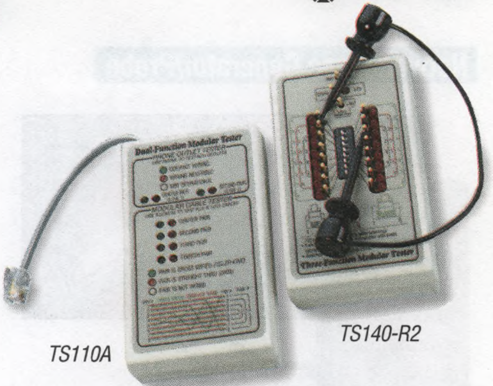
The Dual-Function Tester is for quick continuity testing when both ends of the cable can be plugged into the Tester.

For continuity testing of installed cable, use the Three-Function Tester with a Bounce-Back Unit (TS116). The Three-Function Tester is also a breakout box.

FAXBACK INFORMATION
Request Document Number: 14869
Call 412-746-5500 Anytime

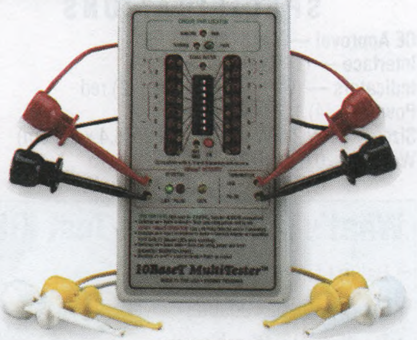
SPECIFICATIONS

CE Approval — TS110A, TS116, TS140-R2
Connectors — TS110A: (2) RJ-45 female, (1) RJ-11 6-wire male; TS140-R2: (2) RJ-45 female
Indicators — TS110A: (8) for modular-cable testing, (4) for phone-outlet testing; TS140-R2: (17) LEDs: (8) for each port, (1) spare
Power — (1) 9-V battery (included)
Size — 5"H x 4"W x 2"D (12.7 x 10.2 x 5.1 cm)
Weight — TS110A: 0.5 lb. (0.2 kg); TS140-R2: 0.8 lb. (0.4 kg)


TS110A
TS140-R2

Item		Code	Price
Modular Tester	Dual-Function	TS110A	**$77.00**
	Three-Function	TS140-R2	**$149.95**
Additional Jumpers for TS140-R2 (Set of Four)		TSJ03	**$20.50**
Bounce-Back Unit		TS116	**$69.95**

10BASE-T Multi-Tester


TS130-R2

10BASE-T Testing at an Economical Price.

- Handheld for complete 10BASE-T testing.
- Bounce-Back Unit serves as the second Multi-Tester!
- The Tester comes with a 9-volt battery, 4 jumper clips, user's manual, and carrying case.

FAXBACK INFORMATION
Request Document Number: 10669
Call 412-746-5500 Anytime

Item	Code	Price
10BASE-T Multi-Tester	TS130-R2	**$195.95**
Bounce-Back Unit	TS116	**$69.95**

SPECIFICATIONS

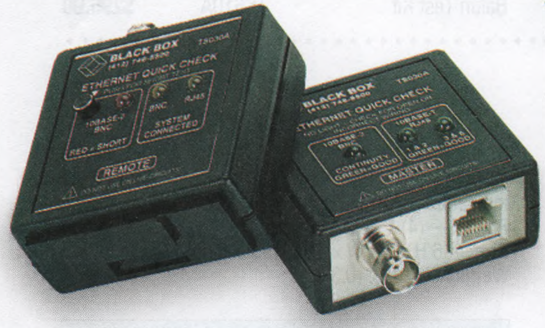
CE Approval — All items listed are approved

10BASE-T Multi-Tester:
Connectors — (2) RJ-45 female
Indicators — 21 LEDs: Red Link Pulse, Green Link Pulse, Data, Tip/Ring, Power, (16) Multiple Cable Testing
Power — 9-V battery (included)

Bounce-Back Unit:
Connectors — (1) RJ-45 female
Indicators — (8) LEDs
Power — 9-V battery
Size — 4.5"H x 2.6"W x 1"D (11.4 x 6.6 x 2.5 cm)
Weight — 0.3 lb. (0.1 kg)

Quick Checks (Ethernet, Multi, BNC Coax)

All You Need for Bench and Remote Testing of UTP and Coax Cables.


TS030A Remote
TS030A Master

SPECIFICATIONS

Connectors — TS030A: (2) BNC, (2) RJ-45; TS031A: (2) RJ-45; TS032A: (2) BNC
Indicators — TS030A: (6) LEDs for continuity; TS031A: (5) LEDs for continuity; TS032A: (3) LEDs
Power — (1) 9-V alkaline battery (included)
Size: — TS030A–TS031A: 2.8"W x 4.8"H x 1"D (7.1 x 12.2 x 2.5 cm); TS032A: 2.3"W x 2.8"H x 1"D (5.8 x 7.1 x 2.5 cm)
Weight — TS030A–TS031A: 0.5 lb. (0.2 kg); TS032A: 0.4 lb. (0.2 kg)

Ethernet Quick Check (TS030A)

- Verify 10BASE-T and 10BASE-2 cable runs.
- Detects shorts, opens, and miswires.
- Splits into master and remote units for testing patch cords or premise cabling.
- Includes battery and carrying case.

TS030A

Multi Quick Check (TS031A)

- Checks Ethernet 10BASE-T, Token Ring, and EIA568A or B cabling.
- Splits apart for benchtop and remote testing.
- Sequencing dual-colored LEDs identify shorts, opens, and miswires.
- Includes battery and case.

TS031A

BNC Coax Quick Check (TS032A)

- Enables benchtop testing of coax with BNC connectors.
- Use Adapters to check cables with different connectors.
- Tests for opens and shorts.
- Includes battery and carrying case.

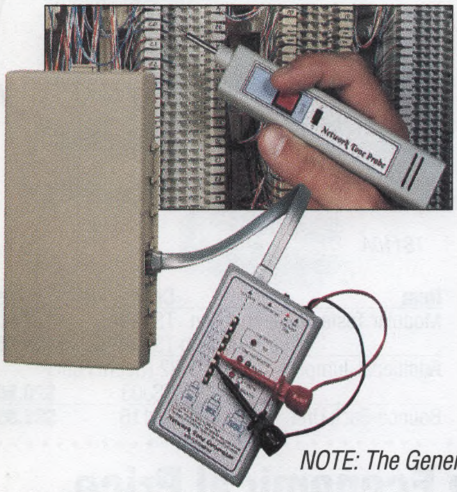
TS032A

FAXBACK INFORMATION
Request Document Number: 14481
Call 412-746-5500 Anytime

NOTE: Do not use these on live cables.

Item	Code	Price
Quick Checks		
Ethernet	TS030A	**$99.95**
Multi	TS031A	**$89.95**
BNC Coax	TS032A	**$44.95**

Network Tone Generator/Probe



The Fastest Way to Find Cables in a Crowded Punchdown Block.

- **Trace and test modular cables.**
- ***One* person can do complete continuity testing.**

It's the easiest way to trace and test modular cables when more sophisticated tests aren't needed.

The low-cost Generator sends a tone along any 4-, 6-, or 8-wire RJ-11 or RJ-45 cable. The pen-sized Probe, an inductive receiver, emits its locator tone when it touches the tip of the wire, or even just the jacket. Now one tech can do the work of two!

SPECIFICATIONS

CE Approval — All items listed are approved
Connectors — (1) RJ-45 female, (2) clip leads
Indicators — (3) LEDs for continuity and polarity
Power — Batteries: TS151: 9 V; TS155–TS156: 12 V
Size — TS151: 3.8"H x 2.3"W x 1"D (9.7 x 5.8 x 2.5 cm); TS155–TS156: 7"H x 1.3"W x 0.8"D (17.8 x 3.3 x 2 cm)
Weight — TS151: 1 lb. (0.5 kg); TS155–TS156: 0.3 lb. (0.1 kg)

Item	Code	Price
Network Tone Generator	TS151	**$89.95**
Network Probe	TS155	**$49.95**
Network Probe II (with Headsets for Noisy Environments)	TS156	**$89.95**

NOTE: The Generator and Probe work as a set so be sure you order both.

Balun Test Kit

Detect Active Balun Pins *without* the Guesswork.

- **Test baluns for AS/400®, S/3X, twinax, or 3270 coax systems.**
- **Tells you immediately which pin is signal and which is ground.**
- **Includes a low-battery indicator and battery self-test LED.**

If a balun goes bad, your system goes down. Now, test baluns on-site in seconds—compared to hours of trial and error.

Test the most popular types of coax and twinax baluns with RJ-11 and RJ-45 pins. The Tester tells you which two leads are active on the RJ side, along with polarity.

FAXBACK INFORMATION
Request Document Number: 12685
Call 412-746-5500 Anytime

Balun Test Kit
BLACK BOX

Balun Test Kit

SPECIFICATIONS

CE Approval — Yes
Interface — (1) RJ-45, (1) BNC
Indicators — (6) LEDs: (4) green, (2) red
Power — (4) 1.5V AA batteries
Size — 6"H x 2.5"W x 0.9"D (15.2 x 6.4 x 2.2 cm)
Weight — 0.6 lb. (0.3 kg)

What's in the Balun Test Kit:

- Balun tester
- Twinax to coax adapter
- RJ-45 to RJ-45 cable
- RJ-45 to RJ-12 cable
- (4) AA batteries
- Carrying case

Item	Code	Price
Balun Test Kit	TS610A	**$295.00**

Token Ring Test Kit

The Basics for Detecting STP or UTP Cabling Errors.

- **Tests for opens, shorts, and open ground on STP cable, opens and shorts on UTP cable.**
- **Fully compatible with IBM® Cabling System Tester Kit, IBM 4760500.**

This lightweight Tester performs like a heavyweight. Use it to detect data connector assembly errors, shorting bar failures, twisted-pair and telephone cable damage. It makes quick work of testing Type 1 and Type 6 patch cables. The Tester monitors leads 1–8 on the RJ-45 side.

Token Ring Test Kit

FAXBACK INFORMATION
Request Document Number: 12623
Call 412-746-5500 Anytime

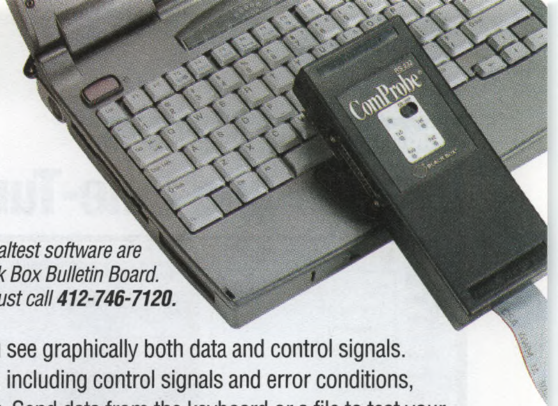
SPECIFICATIONS

CE Approval — Yes
Interface — (1) RJ-45, (1) data connector
Indicators — (6) LEDs: (1) green, (5) red
Power — (4) 1.5V AA batteries
Size — 6"H x 2.5"W x .9"D (15.2 x 6.4 x 2.2 cm)
Weight — 0.6 lb. (0.3 kg)

What's in the Token Ring Test Kit:

- TP cabling system tester and hanger
- Data wrap plug
- (4) AA batteries
- Soft carrying case
- User's guide

Item	Code	Price
Token Ring Test Kit	TS615A	**$215.00**



Serialtest Diagnostic Software

Analyze Data with Your Own PC or Laptop.

- **Turn any PC into a full-featured serial-data protocol analyzer with this software/hardware combo.**
- **Choose the Serialtest 4.5 with ComProbe for the best in testing flexibility and capability. Version 4.5 features new simulation/emulation capabilities plus keyboard macros.**
- **Simple, user-friendly interface.**
- **Choose the Serialtest (Async) for basic async testing.**
- **Pop-up menus make it easy for beginners.**
- **Command lines let power users take shortcuts.**
- **Affordable data analysis using Serialtest.**

Serialtest 4.5 with ComProbe

Test sync or async data being transferred over serial communication links. Use this unique software/hardware monitor combo to sample and capture bidirectional byte or frame-level data using an IBM® PC or compatible, even notebooks.

There's no hardware to install. Just plug the ComProbe into your PC's parallel port and "T" into the connection you want to examine.

FOR COMPARISON: SERIALTEST MODELS

Program Features	Serialtest 4.5	Serialtest (Async)
Character Sets	✓	✓
Parity-Framing Error Detection	✓	✓
String Search	✓	✓
Error Scanning	✓	✓
On-Line Help	✓	✓
Displays Live Data	✓	✓
Time-Stamping	✓	✓
Bidirectionality	✓	✓
String, Control, Error Triggers	✓	✓
Device Emulation/Simulation	✓	
Level 2 Protocols	✓	
Level 3 Protocols	✓	
Sync Data Rates (max.)	64 Kbps	
Async Data Rates (max.)	38.4 Kbps	115.2 Kbps
Parity	None, even, odd, mark, space	
Word Size	5, 6, 7, 8 bits	
Comm Ports	1, 2, 3, 4	

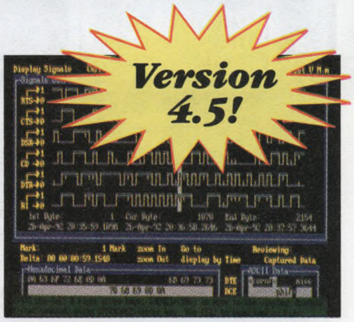
Demo versions of Serialtest software are available on the Black Box Bulletin Board. To try it out, just call ***412-746-7120.***

In Monitor Mode, you see graphically both data and control signals. Store your captured data, including control signals and error conditions, in RAM or directly to disk. Send data from the keyboard or a file to test your communications link. Set your own character-string, error, or control signal "triggers" to start or stop recording data when you're not around. The new triggers and keyboard macros enable you to automatically test and emulate devices.

Serialtest (Async)

This model offers the same capabilities as Serialtest with ComProbe, except it analyzes only async data and doesn't include the new triggers or keyboard macros.

Serialtest (Async) comes with software and cables to analyze your async connection. It requires two serial ports on your PC to monitor bidirectional data.



The RS-232 Lead Status screen provides a graphic representation of all leads at any time.

SPECIFICATIONS

Character Sets — ASCII, 7-bit ASCII, EBCDIC, Baudot

Protocol — TD113V-R2: Async Level 2: Monosync, Bisync, Bisync-BCC, HDLC, SDLC; Level 3: X.25, SNA; TD112: Async only; Ask about new support for Frame Relay, PPP, SLIP, and TCP/IP

System Requirements — TD113V-R2: IBM PC/XT™, AT®, PS/2®, or compatible with one parallel port, 640-KB memory, DOS 2.0 or higher, 3½" floppy drive (hard disk not required); TD112: IBM PC/XT, AT, PS/2, or compatible; 350-KB memory; COM1 or COM2; 3½" floppy drive; DOS 2.1 or higher

Interface — TD113V: RS-232, MIL 188; TD112: RS-232

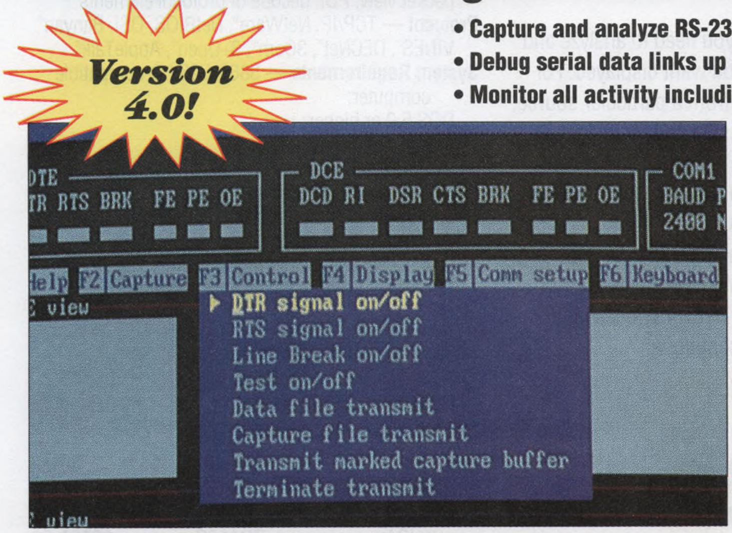
Item	Code	Price
Serialtest 4.5 Diagnostic Software	TD113V-R2	**$1495.00**
Serialtest (Async) Diagnostic Software	TD112	**$305.00**

◆ ◆ ◆

BreakOut-II

Find Data-Signal Errors Fast from Your Own PC.

- **Capture and analyze RS-232 transmissions.**
- **Debug serial data links up to 115 Kbps.**
- **Monitor all activity including time stamps.**
- **Easy-to-use interface.**
- **Customize BreakOut-II to the format you want.**
- **Cable for Monitor Mode is included.**



NOTE: Laptop Adapter is available—call Tech Support.

BreakOut-II, the professional software-based communications problem solver, replaces many of the features found in breakout boxes, data generators, line testers, and data line serial analyzers—and works conveniently from your PC.

Version 4.0 of BreakOut-II features over 50 new features and enhancements—capture all or any part of a data transmission in Monitor Mode or in Interactive Mode. Perform line tests and detect baud rates automatically. Examine and even modify line events for retransmission with time delays.

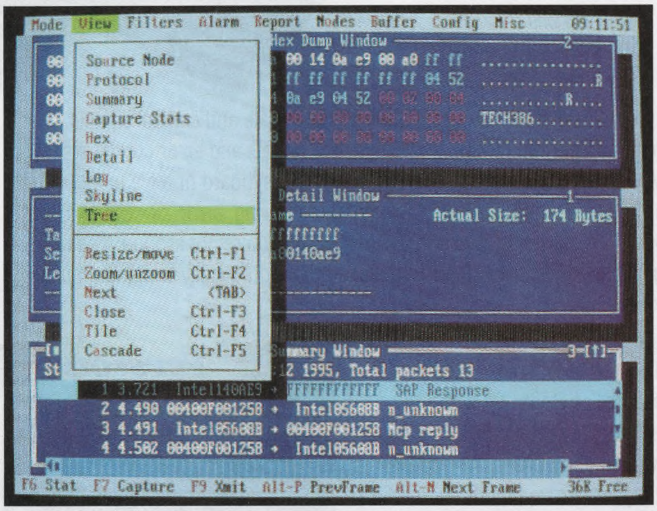
SYSTEM REQUIREMENTS

PC compatible 486 or higher;
540-KB memory;
2 COM ports (NS16550AF supported);
3½" floppy drive;
3 MB of available hard-disk space;
DOS 3.3 or higher

Item	Code	Price
BreakOut-II (Version 4.0) includes 3½" disk, and Cable for Monitor Mode	TD102-R2	**$289.00**

Ethertester with PCMCIA/ISA

Analyze and Fine-Tune Your Network from a Notebook or PC!



```
Hex Dump Window                                   2
00 14 0a e9 00 a0 ff ff  ................
ff ff ff ff ff ff 04 52  ...............R
0a e9 04 52 00 02 00 04  ..........R....
00 00 00 00 00 00 00 00  TECH386........
00 00 00 00 00 00 00 00  ...............

Detail Window                                     1
ame                     Actual Size:  174 Bytes
ffffffff
00140ae9

Summary Window                                    3
12 1995, Total packets 13
 1 3.721  Intel140AE9 → FFFFFFFFFFFF SAP Response
 2 4.490 00400F001258 →  Intel05680B n_unknown
 3 4.491  Intel05680B → 00400F001258 Ncp reply
 4 4.502 00400F001258 →  Intel05680B n_unknown
```

Mission Possible: The extensive Ethertester troubleshooting guide gives you tips on strategic solutions for network problems.

BLACK BOX
(412) 746-5500
Ethertester
Insert This Way

Why pay for expensive rental equipment and consultants? The Ethertester with PCMCIA and ISA interfaces analyzes network performance and helps you solve problems yourself.

MORE! Ethernet Solutions, see pp. 558–589.

- **Available with adapter for PCMCIA interface or ISA card.**
- **Solve network problems and increase performance. Get information on users, error and collision totals, and eight different views of the network.**
- **Customize proprietary protocols or protocol-decode descriptions.**
- **Set audible and graphic alarms for problem nodes or data types.**
- **Eliminate exorbitant fees for specialists and rented analyzers.**

You're a network manager. You know that so much at your organization relies on the network. You need a strategy, one that enables you to react quickly when trouble occurs, one that gives you the power to solve problems *fast*. And you need to make your budget, too.

The solution is Ethertester, a PC-based Ethernet network analyzer that fits your strategy *and* your budget. Able to run on any PC or notebook, Ethertester is the missing piece in your network troubleshooting puzzle.

Ethertester gives you dynamic seven-layer decoding, statistics, and diagnostics via PCMCIA and ISA network interfaces. Its online tutor and troubleshooting guide give tips on how you can solve network problems quickly. And with Ethertester's powerful Protocol Definition Language, you can define proprietary protocols or customize protocol-decode descriptions.

Ethertester is the cost-effective choice for outfitting field support organizations. Use its import/export feature to convert captured files into Sniffer® format for additional analysis back at the home office.

What Else Can It Do?

Develop Benchmarks and Test Capacities.

Ethertester can resend captured buffer files onto the network to measure the impact of additional traffic on network and node performance. And you can revise packet addresses or generate random addresses.

Perform Simultaneous Tasks.

Capture buffers for later analysis. You can log data while monitoring traffic with the "capture-to-disk" function.

Filter Data Efficiently.

Capture only the data you need to analyze and separately filter the data you want displayed. For example, capture packets from a particular source, then display only those designated for insight into particular usage patterns. You can also use filter definitions to sound alarms and graphic alerts.

Easy to Learn, Easy to Use!

The Ethertester features pull-down menus and optional mouse support. You can select startup defaults, define names for network nodes, and tailor protocol-decode descriptions.

So equip yourself with the right tool and do the job right—yourself. The Ethertester with PCMCIA and Ethertester with ISA are smart investments that carry long-term paybacks.

Count on Black Box for your network solutions.

SPECIFICATIONS

Data Views — Packet count by node, packet count by protocol type, summary packet description, user-selected log events, historical view of traffic statistics, hierarchy of protocol elements with occurrence counts of each element, hexadecimal packet view, PDL decode of protocol elements

Protocol — TCP/IP, NetWare®, NetBIOS, OSI, Banyan® VINES™, DECNet™, 3Com®, 3+Open®, AppleTalk®

System Requirements — 386SX/25 PC-compatible computer;
DOS 5.0 or higher;
5-MB hard disk space;
VGA monitor, 640 x 480 resolution (43/50 line modes supported);
640-KB memory (supports expanded memory)

CE Approval — All items listed are approved

Interface — PCMCIA interface (requires Type II PCMCIA), ISA-compatible network interface card

FAXBACK INFORMATION
Request Document Number: 14553
Call 412-746-5500 Anytime

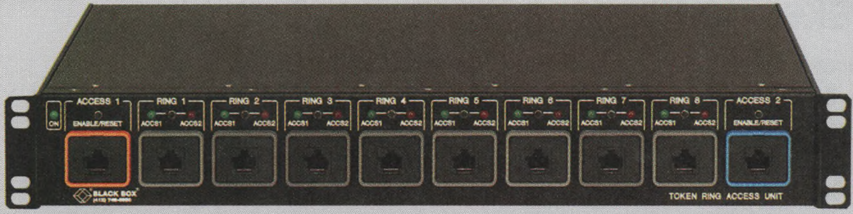
Item	Code	Price
Ethertester		
with PCMCIA	TD115C-R2	$2995.00
with ISA	TD116C	$2995.00

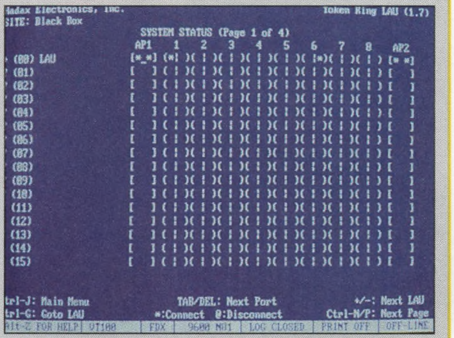
> ***"Now when our network goes down, I don't feel so helpless. I can't count the number of times the Ethertester has helped us solve our network problems."***

• NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ •

Token Ring LAN Access Unit

Share a LAN Analyzer between Networks—from One Central Location.





```
adax Electronics, Inc.                                   Token Ring LAU (1.7)
SITE: Black Box
                          SYSTEM STATUS (Page 1 of 4)
                        AP1    1    2    3    4    5    6    7    8    AP2
 (00) LAU              [*_*] (*| )( | )( | )( | )( | )( |*)( | )( | ) [* *]
 (01)                  [   ] ( | )( | )( | )( | )( | )( | )( | )( | ) [   ]
 (02)                  [   ] ( | )( | )( | )( | )( | )( | )( | )( | ) [   ]
 (03)                  [   ] ( | )( | )( | )( | )( | )( | )( | )( | ) [   ]
 (04)                  [   ] ( | )( | )( | )( | )( | )( | )( | )( | ) [   ]
 (05)                  [   ] ( | )( | )( | )( | )( | )( | )( | )( | ) [   ]
 (06)                  [   ] ( | )( | )( | )( | )( | )( | )( | )( | ) [   ]
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 (12)                  [   ] ( | )( | )( | )( | )( | )( | )( | )( | ) [   ]
 (13)                  [   ] ( | )( | )( | )( | )( | )( | )( | )( | ) [   ]
 (14)                  [   ] ( | )( | )( | )( | )( | )( | )( | )( | ) [   ]
 (15)                  [   ] ( | )( | )( | )( | )( | )( | )( | )( | ) [   ]

trl-J: Main Menu              TAB/DEL: Next Port                +/-: Next LAU
trl-G: Goto LAU            *:Connect  @:Disconnect         Ctrl-N/P: Next Page
Alt-Z FOR HELP| VT100  | FDX |  9600 N01 | LOG CLOSED | PRINT OFF | OFF-LINE
```

- **Connect a LAN analyzer to any of eight networks—from one site or locally.**
- **Use it with network analyzers you already own.**
- **Provides remote and local access and control from CTR, PA, or ASCII CPU.**

With the LAN Access Unit (LAU), you can connect a LAN analyzer from one central location to any of eight Token Ring networks. So you don't have to buy multiple LAN analyzers or lug an analyzer from site to site.

The Token Ring LAU enables you to connect one or two analyzers to access any of eight IEEE 802.5-compliant Token Ring networks. Control the LAUs from a central site through front-panel switches, ASCII character strings, terminals, or HP® Open View® Windows. The LAUs test system can include up to 64 LAUs.

It features two access ports for connecting LAN analyzers, and eight ring ports to connect the networks. Ports have DB9 or RJ-45 connectors.

The firmware used to control the LAU via a controlling terminal offers three screens: System Status, Operations/Assignments, and Site Parameters. The System Status Screen shows you the access ports connected to each Token Ring and enables you to connect or disconnect segments. With the Operations/Assignments screen, you can select a specific LAU in the system to edit IDs and to connect or disconnect access ports. Use the Site Parameters Screen to change the name of the LAU system.

FAXBACK INFORMATION
Request Document Number: 12805
Call 412-746-5500 Anytime

SPECIFICATIONS

Data Rate — Up to 9600 bps
Connectors — (2) DB9, (8) RJ-45
Indicators — LEDs: (1) Power, (8) ACCS1, (8) ACCS2
Power — 115 VAC, 60 Hz or 230 VAC, 50 Hz
Size — 2.6"H x 19"W x 11.8"D (6.6 x 48.3 x 30 cm)
Weight — 10 lb. (4.5 kg)

Item	Code	Was	NOW!
Token Ring LAN Access Unit	TS750A	~~$1395.00~~	$795.00
remember to order cables: Category 5, Solid-Conductor, 4-Pair, Straight-Pinned, 5-ft. (1.5-m)	EYN737MS-0005		$9.95

For other lengths and pinnings, see p. 68.

◆ ◆ ◆

Remote Access and Test System

Remote Access to Faulty Communication Lines.

- **Provides access to data lines for any vendor's test equipment.**
- **Remote/local access and control from a CRT, PC, or ASCII terminal.**
- **Menu-driven for ease of use, password log-on for security.**

Here's centralized network access for monitoring and testing remote or unattended network locations. Use a PC, CRT, or ASCII terminal to control the System and you can access any line in as many as 256 sites. The System can bridge into a line or you can connect the test analyzer to either port of your DTE-DCE connection. The System Rackmount Chassis can accommodate a Control Card and up to 16 Universal Bridge Cards or Bridge/Break Cards.

The Remote Access and Test System features a detailed, easy-to-understand menu setup.

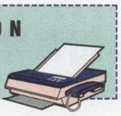
The System also guides you through the program by presenting options on the screen. Not sure which option to take? No problem. A special "help" feature is available for each option, providing on-screen instruction.

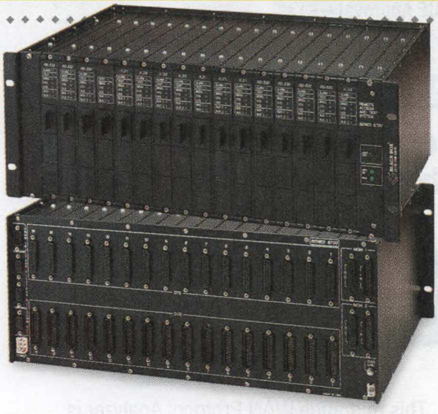
You can secure your System by configuring it with a password in order to log on. This option is enabled/disabled by a DIP switch on the Control Card.

SPECIFICATIONS

CE Approval — 230-VAC version: TS776E
Interface — 115-VAC module line or 230-VAC module
Power — 115 VAC, 60 Hz or 230 VAC, 50 Hz
Size — TS770A: 7"H x 19"W x 11.8"D (17.8 x 48.3 x 30 cm);
TS771C–TS774C: 7"H x 1"W x 10.5"D (17.8 x 2.5 x 26.7 cm);
TS775C–TS776: 6.3"H x 3.5"W x 2.5"D (16 x 8.9 x 6.4 cm)
Weight — TS770A: 14.5 lb. (6.6 kg);
TS771C–TS775C: 0.6 lb. (0.3 kg);
TS776: 0.8 lb. (0.4 kg)

FAXBACK INFORMATION
Request Document Number: 13631
Call 412-746-5500 Anytime





Item	Code	Price
Rackmount Chassis 16-Line F/F	TS770A	$695.00
Universal Bridge Cards		
1 Bus	TS771C	$180.00
2 Bus	TS772C	$250.00
Universal Bridge/Break Cards		
1 Bus	TS773C	$250.00
2 Bus	TS774C	$315.00
Terminal Control Card	TS775C	$700.00
115-VAC Power Module	TS776	$150.00
Adapter Plug DB25M/V.35		
Male	TS781	$35.00
Female	TS780	$35.00
Blank Panel	TS777C	$7.00
remember to order cables: Inter-Rack Control Cables		
3-ft. (0.9-m)	TS778	$25.00
8-ft. (2.4-m)	TS779	$30.00

Scanners
Modular Testers
Network Diagnostics
Activity Monitors
Fiber Testers

New Internet and NetWare® Software!

• NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $

TECH SUPPORT'S PRODUCT OF CHOICE
NetRanger
Diagnose
1. Are Servers OK?
2. Why Can't I Log in?
4. Why Does Connect Drop
5. Is This Cable OK?
SELECT
BLACK BOX
ESCAPE
DIAGNOSE

NetRanger

Software Upgrade with a Price "Downgrade" Makes NetRanger a Better Buy than Ever!

- **Locates network problems with the push of a button.**
- **Verifies the integrity of your network cable.**

If you ever respond to LAN trouble calls, NetRanger can make your job infinitely easier. Designed for LAN administrators and network technicians, NetRanger combines the best of cable testers, protocol analyzers, and network diagnostics in one easy-to-use tool.

And new NetRanger software gives you even more testing power and convenience.

New Internet Convenience

Now you can troubleshoot your corporate Intranet and Internet connections. Determine if hosts, including Web servers and e-mail gateways, are available to users worldwide. Easily isolate problems with your corporate routers, Internet connection, or Internet service provider.

New NetWare Convenience

Select your network problem from the menu and NetRanger will perform a series of tests to identify its cause. It can diagnose problems inside NetWare® fileservers via the NetWare Loadable Module (NLM). Use the new NetRanger to troubleshoot Ethernet cabling, protocol, and serial-link problems as well as monitor network traffic.

This backlit, handheld unit attaches anywhere on your network—to a workstation, a hub, or a server. It detects the type of connection, then runs the right tests. And if you need to insert the NetRanger *between* a file server or workstation and a hub, you *can*—thanks to NetTap, a built-in feature which monitors traffic between any node and a hub.

NetRanger includes NetWare, Internet, and NT software, NetWare Loadable Module, (1) far-end adapter, (2) mod 8 patch cables, (1) AC adapter, and a carrying case.

FAXBACK INFORMATION
Request Document Number: 14560
Call 412-746-5500 Anytime

SPECIFICATIONS

NetWare — Frame types: 802.2, 802.3, Ethernet II, SNAP; Ping: IPX™, IP

Protocol — IPX, LST, DECnet™, ISO, AppleTalk®, ARP, XNS

CE Approval — Yes

Connectors — (1) BNC coax, (2) RJ-45, (1) DB9 male, (1) DB9 female

Power — 9.6-volt nickel-cadmium battery, included; 9-volt AC adapter, included

Size — 8"H x 4"W x 2.2"D (20.3 x 10.2 x 5.6 cm)

Weight — 1.8 lb. (0.8 kg)

NOTE: A TCP/IP module is now available for the NetRanger! Call Tech Support for details.

Item	Code	Was	NOW!
NetRanger	TS850A-R2	~~$2995.00~~	**$2595.00**

WAN Protocol Analyzers

Here's a WAN Analyzer That's Powerful and Portable.

This midrange WAN Protocol Analyzer is truly portable. It weighs less than 5 pounds (3 kg). You get power, too—its software runs under Microsoft® Windows® at 256 Kbps. Tester includes V.35 and RS-232 lead cables, power supply cable, and external trigger cables.

CE Approval — All items listed are approved

FAXBACK INFORMATION
Request Document Number: 13198
Call 412-746-5500 Anytime

Item	Code	Price
WAN Protocol Analyzer		
Single-Channel	TS700A	**$6200.00**
Dual-Channel	TS701A	**$9590.00**

Pin Point

Diagnose Problems *Fast!* Save on Repair Time with Easy-to-Use Pin Point.

- **Quickly diagnoses 10BASE-T network and computer problems.**
- **It's a time-saver—and a money-saver!**

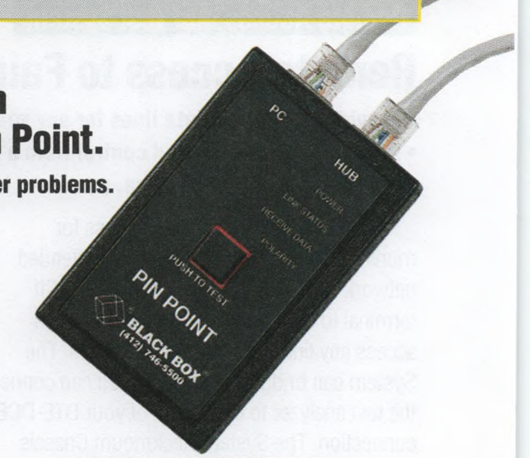
Time is *not* on your side—especially when you have network troubles, and crucial deadlines to meet.

The Pin Point is a hand-held tester ideal for cutting your troubles in half. Run just two simple tests and Pin Point tells you whether you have a 10BASE-T connection problem or a computer glitch.

An immediate diagnosis means you get a call out fast—and to the right specialist. You save time up front and money in diagnostic and specialist charges.

Time is money. Save both with the Pin Point.

FAXBACK INFORMATION
Request Document Number: 15602
Call 412-746-5500 Anytime



SPECIFICATIONS

Connectors — (2) RJ-45 jacks

Indicators — Power, Link Status, Receive Data, and Polarity

Power — 9-volt alkaline battery (included)

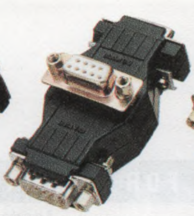
Size — 3.8"H x 2.4"W x 1"D (9.7 x 6.1 x 2.5 cm)

Weight — 0.5 lb. (0.2 kg)

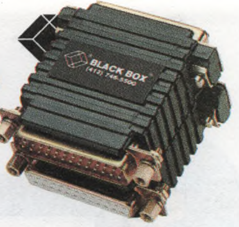
Item	Code	Price
Pin Point	TS020A	**$249.00**
remember to order cables	Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

3-Way RS-232 Tap



3-Way DB9 Tap



4-Way DB25 Tap

Data Taps

Monitor Your Data Lines—*without* Interrupting Data Flow.

- **Tap into and monitor active lines with a data scope.**
- **An economical solution for a "Y" or 4-way connector cable, temporary or permanent.**
- **Choose three-way DB25, three-way DB9, or four-way DB25.**
- **All possible gender connections are available.**

Here are three innovative yet inexpensive ways to monitor RS-232 data lines without interrupting users *or* data flow. Just plug your data cables into the straight-through connectors. Then link your data scope to the Tap Connector.

RS-232 Tap—Has three DB25 connectors: two for data flow, and one to monitor the RS-232 data line. Or connect two terminals in parallel to one RS-232 port. All 25 pins are carried through to all three connectors.

DB9 Tap—This Tap features three DB9 connectors for monitoring RS-232, RS-422, or 802.5 data lines. All 9 pins are carried through.

DB25 Tap—This data junction box features four DB25 connectors with all 25 pins connected straight through on all four connectors. It comes with two male and two female connectors, but you can order it with any combination of connector genders.

FAXBACK INFO
Request Document Number: 14467
Call 412-746-5500
Anytime

Item	Data Connectors	Tap Connector(s)	Code	Price
Data Taps				
RS-232 (3 DB25 Connectors)				
	Female-Female	Female	FA140A	**$19.95**
	Female-Female	Male	FA141A	**$19.95**
	Male-Female	Female	FA142A	**$19.95**
	Male-Female	Male	FA143A	**$19.95**
	Male-Male	Female	FA144A	**$19.95**
	Male-Male	Male	FA145A	**$19.95**
DB9 Taps (3 DB9 Connectors)				
	Female-Female	Female	FA146A	**$19.95**
	Female-Female	Male	FA147A	**$19.95**
	Male-Female	Female	FA148A	**$19.95**
	Male-Female	Male	FA149A	**$19.95**
	Male-Male	Female	FA150A	**$19.95**
	Male-Male	Male	FA151A	**$19.95**
DB25 Taps (4 DB25 Connectors)				
	Female-Female	Female-Female	FA152A	**$29.95**
	Male-Female	Female-Female	FA153A	**$29.95**
	Male-Female	Male-Female	FA154A	**$29.95**
	Male-Male	Female-Female	FA155A	**$29.95**
	Male-Male	Male-Female	FA156A	**$29.95**
	Male-Male	Male-Male	FA157A	**$29.95**

remember to order cables ***Different applications require different cables. Call Tech Support to be sure you order the right one.***

DB9 PockeTester

Monitor DB9 Data Ports. Spot Faults Fast.

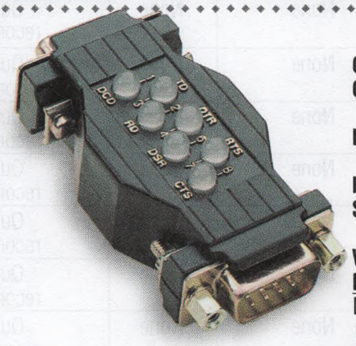
- **Monitor seven RS-232 signals.**
- **Colorful LEDs glow brilliantly. Check system status instantly from anywhere in the room.**
- **All 9 pins are wired straight through.**

Quickly test RS-232 signals on DB9 ports, such as those on printers, your AT®, or notebook.

PockeTester monitors the seven most important async data and control lines: TD, RD, DTR, DSR, RTS, CTS, DCD.

Just attach PockeTester to any RS-232 DB9 interface. One quick glance at the LEDs tells you the status of each line: mark, space, or no signal.

All nine pins are wired straight through for accurate testing. The red and green LEDs are easy to read. In fact, you can even infer data bias from the intensity of the color.



FAXBACK INFO
Request Document Number: 14539
Call 412-746-5500
Anytime

SPECIFICATIONS

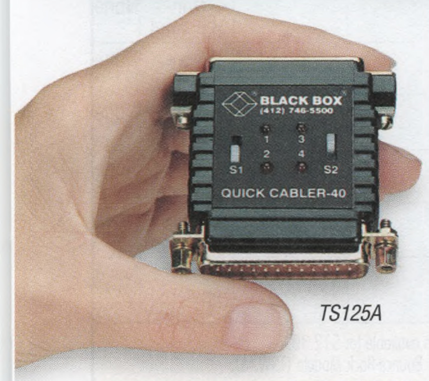
CE Approval — Yes
Connectors — (1) DB9 female, (1) DB9 male
Indicators — (7) Tri-state LEDs: TD, RD, DTR, DSR, RTS, CTS, DCD
Power — None required
Size — 2.7"H x 1.2"W x 0.8"D (6.8 x 3 x 2 cm)
Weight — 1 lb. (0.5 kg)

Item	Code	Price
DB9 PockeTester	TS500A	**$29.50**
remember to order cables RS-232 Cable, 4-Conductor, 10-ft. (3.0-m)	ECM04C-0010	**$13.95**

For other lengths, see p. 83.
Specify gender when ordering.

Quick Cablers

This Intelligent Connector Makes All RS-232 Hardware Compatible.



TS125A

- **Self-configuring—just plug it in. No need for special cables.**
- **Matches all async data, handshake, and control lines.**
- **Works with any RS-232 computer or peripheral.**
- **Transparent to protocol, word length, format, and more.**
- **Works with any data rate, from 50 bps to 19.2 Kbps!**

End the frustration of connecting two "compatible" RS-232 devices only to discover your cable doesn't work.

With these Quick Cablers, you can interconnect any async RS-232 PC, printer, modem, or other peripheral. Just plug the unit in-line, and it configures itself. Quick Cabler actually samples the data signals and uses its internal logic to make the right connection.

Quick Cabler is transparent to all protocols, and supports any data rate from 50 bps to 19.2 Kbps. Choose from two models. Quick Cabler-40 (TS125A) is shown here. Quick Cabler-50 (TS126A—not shown) makes connections even easier. It comes with two 3-foot (0.9-m) ribbon cables featuring male/female connectors on each end. So you always have the right gender, and a spare connector whenever you need it.

FAXBACK INFO
Request Document Number: 14450
Call 412-746-5500
Anytime

SPECIFICATIONS

Interface — RS-232
CE Approval — All items listed are approved
Connectors — TS125A: (1) DB25 female, (1) DB25 male; TS126A: (2) DB25 female, (2) DB25 male, each on a 3-ft. (0.9-m) cable
Indicators — LEDs: (4) to select pinouts
Power — From the interface

Item	Code	Price
Quick Cabler-40	TS125A	**$49.00**
Quick Cabler-50	TS126A	**$69.00**
remember to order cables RS-232 Cable 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.

BUYER'S GUIDE

FOR COMPARISON: STATUS ACTIVITY MONITORS, BREAKOUT BOXES

	Model	Leads Monitored	LED Type*	Special Features	Connectors	Patching Voltage Source	Jumpers: Straight/ Daisychain†	Batteries‡	Case
	RS-232 SAMs								
Ⓐ	**TS165A** **232-65 Tri-State Plus**	2–6, 8, 15, 17, 20–22, 25; (1) spare	Tri-state	Built-in voltmeter. Switches for crossing TD and RD, and pulling CTS, DSR, DCD high	(2) Dual-gendered DB25 on each end	+V, -V	5/1†	(3) 9-volt‡	Soft
Ⓑ	**TS162A** **232-60 Tri-State**	2–6, 8, 15, 17, 20–22, 25; (1) spare	Tri-state	Switches for crossing TD and RD and pulling CTS, DSR, or DCD high	(2) Dual-gendered DB25 on each end	+V, -V	5/1†	(1) 9-volt‡	Soft
Ⓒ	**TS010A** **232-100**	All 25	Dual-state	Optional Bounce-Back Module supports continuity testing§	(2) Dual-gendered DB25 on each end	+V, -V	5/1†	(2) 9-volt‡	Hard
Ⓓ	**TS170A** **232-55 Dual-State**	2–6, 8, 15, 17, 20–22, 25; (1) spare	Dual-state	Built-in pulse trap	(1) DB25M, (1) DB25F	+V, -V	5/1†	(2) 9-volt‡	Hard
	V.35 SAM								
Ⓔ	**TS291A**	P/S, R/T, C, D, E, F, Y, A/A, V/X, H	Tri-state	Monitors V.35 data through an RS-232 datascope	(1) M, (1) F (1) 34-pin M-block	+V, -V	5/1	(2) 9-volt	Soft
	RS-449 SAM								
Ⓕ	**TS270A**	SD, ST, RD, RS, RT, CS, DM, TR, RR, TT	(10) Single-, (1) tri-state	Monitors 10 leads; patches all 37	(1) DB37M, (1) DB37F		5/1	(2) 9-volt	Hard
	X.21 SAM								
Ⓖ	**TS021A**	2–6, 9–13	Dual-state	Pulse trap, RS-232 monitor port	(1) DB25F, (1) DB15M, (1) DB15F		10	(1) 1.5 VDC	Soft
	RS-232 Mini Matchers								
Ⓗ	**TS002A** **DB25M–DB25F**	None	None	Quick and easy cable reconfiguration; compact	(1) DB25M, (1) DB25F		25/0	Non-powered	None
	TS004A **DB25M–DB25M**	None	None	Quick and easy cable reconfiguration; compact	(2) DB25M		25/0	Non-powered	None
	TS005A **DB25F–DB25F**	None	None	Quick and easy cable reconfiguration; compact	(2) DB25F		25/0	Non-powered	None
	TS042A **DB9M–DB9F**	None	None	Quick and easy cable reconfiguration; compact	(1) DB9M, (1) DB9F		9/0	Non-powered	None
	TS043A **DB9M–DB9M**	None	None	Quick and easy cable reconfiguration; compact	(2) DB9M		9/0	Non-powered	None
	TS044A **DB9F–DB9F**	None	None	Quick and easy cable reconfiguration; compact	(2) DB9F		9/0	Non-powered	None
	TS045A **DB9M–DB25F**	None	None	Quick and easy cable reconfiguration; compact	(1) DB9M, (1) DB25F		9/0	Non-powered	None
	TS046A **DB9M–DB25M**	None	None	Quick and easy cable reconfiguration; compact	(1) DB9M, (1) DB25M		9/0	Non-powered	None
	TS047A **DB9F–DB25F**	None	None	Quick and easy cable reconfiguration; compact	(1) DB9F, (1) DB25F		9/0	Non-powered	None
	TS048A **DB9F–DB25M**	None	None	Quick and easy cable reconfiguration; compact	(1) DB9F, (1) DB25M		9/0	Non-powered	None
	RS-232 Quick Tests								
Ⓘ	**TS001A-R2** **DB25M–DB25F**	2–6, 8, 20, 22	Dual-state	Monitor status of common RS-232 leads	(1) DB25M, (1) DB25F			Non-powered	None
	TS009A **DB25M–DB25F**	2–6, 8, 15, 17, 20–22, 25; (1) spare	Dual-state	Monitors status of common RS-232 leads	(1) DB25M, (1) DB25F			Non-powered	None
	TS034A **DB9M–DB9F, 8-Line**	1–4, 6–9	Dual-state	Monitor status of common RS-232 leads; Cable adapter	(1) DB9M, (1) DB9F			Non-powered	None
	TS035A **DB9M–DB25F, 8-Line**	2–6, 8, 20, 22	Dual-state	Monitor status of common RS-232 leads; Cable adapter	(1) DB9M, (1) DB25F			Non-powered	None
	TS036A **DB9F–DB25M, 8-Line**	2–6, 8, 20, 22	Dual-state	Monitor status of common RS-232 leads; Cable adapter	(1) DB9F, (1) DB25M			Non-powered	None
	TS037A **DB25M–DB25F, 17-Line**	1–17	Dual-state	Centronics; Monitor status of RS-232 leads; Pulse stretch circuit	(1) DB25M, (1) DB25F			Non-powered	None

* LEDs: Single-state has 1 LED: Red for High, Off for Low; Dual-state has 2 LEDs: Red for High, Green for Low; Tri-state has 2 LEDs: Red for High, Green for Low, Off for Unattended.

† Jumpers can be ordered separately for models marked with †. Straight jumpers (TSJ001) are $1.03, and 4-pin daisychain jumpers (TSJ002) are $2.05.

‡ An optional 115-VAC, 60-Hz AC power adapter (PS175) is available for $12.30.

§ Call Technical Support for more information about optional Bounce-Back Module (TSW76).

A SAM 232-65 Tri-State Plus

- Includes switches for crossing TD and RD, and for pulling CTS, DSR, or DCD high.
- Our top-of-the-line Status Activity Monitor.
- Built-in voltmeter.

Size — 2"H x 4.5"W x 6.5"D
(5.1 x 11.4 x 16.5 cm)

Item	Code	Price
SAM 232-65 Tri-State Plus	TS165A	**$325.00**

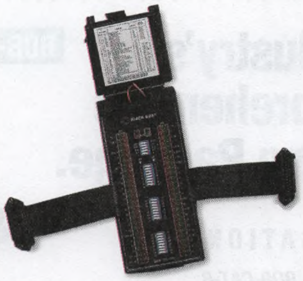
B SAM 232-60 Tri-State (Powered)

- Includes switches for crossing TD and RD, and for pulling CTS, DSR, or DCD high.

CE Approval — Yes
Size — 2"H x 4.5"W x 6.5"D
(5.1 x 11.4 x 16.5 cm)

Item	Code	Price
SAM 232-60 Tri-State (Powered) Soft Case	TS162A	**$260.00**

C SAM 232-100

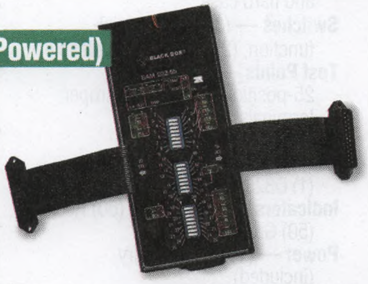


- Monitors all 25 leads.
- Tests cables for continuity.
- Optional Bounce-Back Module available.

CE Approval — TS010A
Size — TS010A: 1.6"H x 3"W x 7.1"D
(4.1 x 7.6 x 18 cm)

Item	Code	Price
SAM 232-100	TS010A	**$235.00**
Bounce-Back Module (P-CAT)	TSW76	**$52.00**

D SAM 232-55 Dual-State (Powered)



- Built-in pulse trap monitors even the briefest changes of state.

CE Approval — Yes
Size — 1.5"H x 2.9"W x 5.5"D
(3.8 x 7.4 x 14 cm)

Item	Code	Price
SAM 232-55 Dual-State (powered)	TS170A	**$205.00**

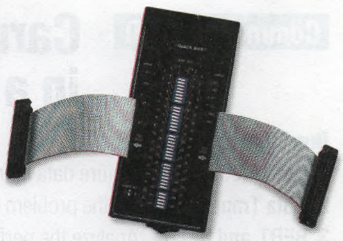
E SAM V.35

- Crossover, patch, or jumper any combination of leads.
- Built-in RS-232 cable for monitoring V.35 data on an RS-232 datascope.

CE Approval — Yes
Size — 2"H x 4.5"W x 6.5"D
(1.5 x 5.3 x 5.6 cm)

Item	Code	Price
SAM V.35	TS291A	**$625.00**

F SAM +449



- Full RS-449 breakout-box function.
- Monitors 10 leads.
- Patches all 37 leads.

CE Approval — Yes
Size — 1.5"H x 2.9"W x 5.6"D
(3.8 x 7.4 x 14.2 cm)

Item	Code	Price
SAM +449	TS270A	**$410.00**

G SAM X.21

- Patches and monitors all 37 leads of RS-422 interface.
- Use the RS-232 adapter to test on any RS-232 datascope.

Size — 1.9"H x 4.3"W x 6.7"D
(5 x 11 x 17 cm)

Item	Code	Price
SAM X.21	TS021A	**$290.00**

H Mini Matchers

TS042A

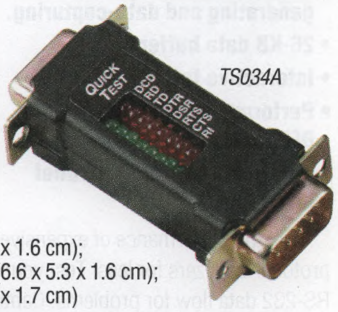
- Build your own custom-pinned DB25 connectors quickly and easily to match specialty DB25 cable.

Size — TS002A, TS004A–TS005A: 0.6"H x 2.1"W x 2.2"D
(1.5 x 5.3 x 5.6 cm);
TS042A–TS044A: 2.2"H x 1.2"W x .64"D (5.6 x 3.0 x 1.6 cm)
TS045A–TS048A: 2.6"H x 2.1"W x .65"D (6.6 x 5.3 x 1.6 cm)

Item	Code	Price
Mini Matchers		
DB25M–DB25F	TS002A	**$30.70**
DB25M–DB25M	TS004A	**$30.70**
DB25F–DB25F	TS005A	**$30.70**
DB9M–DB9F	TS042A	**$23.00**
DB9M–DB9M	TS043A	**$23.00**

Item	Code	Price
Mini Matchers		
DB9F–DB9F	TS044A	**$23.00**
DB9M–DB25F	TS045A	**$28.00**
DB9M–DB25M	TS046A	**$28.00**
DB9F–DB25F	TS047A	**$28.00**
DB9F–DB25M	TS048A	**$28.00**

I Quick Tests



TS034A

- Monitors the status of the most commonly used RS-232 leads.

Size — TS001A-R2: 0.6"H x 2.1"W x 2.2"D
(1.5 x 5.3 x 5.6 cm);
TS009A: 1.5"H x 2.9"W x 5.5"D
(3.8 x 7.4 x 14 cm);
TS034A: 2.2"H x 1.2"W x .64"D (5.6 x 3.0 x 1.6 cm);
TS035A–TS036A: 2.6"H x 2.1"W x .65"D (6.6 x 5.3 x 1.6 cm);
TS037A: 3.5"H x 2.3"W x .66"D (8.9 x 5.8 x 1.7 cm)

Item	Code	Price
Quick Tests		
Model B (QT-B)	TS001A-R2	**$41.00**
Model B-Plus (QT-P)	TS009A	**$58.00**
DB9M–DB9F, 8-Line	TS034A	**$30.00**

Item	Code	Price
Quick Tests		
DB9M–DB25F, 8-Line	TS035A	**$30.00**
DB9F–DB25M, 8-Line	TS036A	**$30.00**
DB25M–DB25F, 17-Line	TS037A	**$60.00**

> ***"In my consulting business, I use the Quick Test Model B-Plus to identify what cables are connected to what pins. I really save time because now I can spot problems in minutes."***
>
> J. Richard Burke, Ph.D.
> President, J. Richard Burke, Inc.

Comm Tool 1000

Carry a Whole Toolbox of Testers—in a Single Instrument!

Run Eight Kinds of Tests:

1. **Data Monitoring.** Capture data in transit and see it on the LCD.
2. **Data Trapping.** Isolate the problem by trapping on certain conditions.
3. **BERT and BLERT.** Analyze the performance of a modem or mux.
4. **Device Exercising.** Check your printers and peripherals.
5. **Device Simulation.** The Comm Tool mimics either host or slave, so you don't have to interrupt your mainframe or mini's processing.
6. **Breakout-Box Function.** Fast and easy RS-232 pinout testing.
7. **Cable Testing.** Isolate breaks in cable continuity.
8. **Pulse-Level Voltmeter.** Find voltage-level problems for marginal RS-232 devices.

Easy-to-follow menus guide you through testing and setup. Automatic configuration matches the speed and character structure of any async bit data stream you need to test up to 38.4 Kbps.

Comm Tool 1000 is compatible with async, sync, SDLC, and Centronics® and Dataproducts® parallel formats. And nonvolatile memory permanently stores your favorite test setups.

FAXBACK INFO
Request Document Number: 11093
Call 412-746-5500
Anytime

SPECIFICATIONS

Package Includes — Comm Tool 1000 includes a DB25 dual-gender ribbon cable, a 36-pin ribbon cable, power supply and soft case

Data Format — ASCII, EBCDIC, Baudot, Transcode

Speed — Async: 50 bps to 38.4 Kbps

Interface — RS-232 serial, Centronics parallel, Dataproducts parallel

Connectors — (2) DB25 female, (1) 36-pin Centronics female

Indicators — (100) LEDs: (50) Red, (50) green; 32-character LCD

Power — (3) 9-volt alkaline batteries, (1) AC adapter (not intended for recharging)

Size — 3.4"H x 10.9"W x 6"D (8.6 x 27.7 x 15.2 cm)

Weight — 2.6 lb. (1.2 kg), including batteries

Item	Code	Price
Comm Tool 1000	DT450A	**$1330.00**

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Black Fox

The Industry's Most Comprehensive RS-232 Testing Package.

BOB-CAT-B

- **Analyzes format and content of data.**
- **Extensive options for data-generating and data-capturing.**
- **26-KB data buffer.**
- **Interactive tutorial diskette.**
- **Performs standard async BERT/BLERT tests.**
- **Works with serial or parallel interfaces.**

Get the performance of expensive protocol analyzers for less. Test your RS-232 data flow for problems. Capture data as it comes from your computer or send test data to your modem or printer—the BLACK BOX® Black Fox tells you the right speed, parity, character length, and number of stop bits.

Black Fox can capture up to 26 KB of incoming data, analyze it, store it, let you edit it, and then retransmit it.

Test your modem for speed and accuracy with all the standard Bit/Block Error Rate tests. Or measure the speed of your serial or parallel printer.

Select tests or change parameters in just seconds with the four-button control and easy-to-follow menu system.

SPECIFICATIONS

BLACK FOX:

Package Includes — (2) DB9 ribbon cables, (1) 3-headed DB25 ribbon cable, (1) 9- to 25-pin adapter with (2) DB9 and (2) DB25 connectors, 1 power supply, manual, and hard case

Buffer — 26 KB (nonvolatile)

Data Format — 7 or 8 data bits, 1 or 2 stop bits, even/odd/no parity

Display — 2 x 16 characters, LCD

Functions — Fox Mode, Data Mode, Buffer Mode, Autobaud, Printerbaud, Printer Speed, BERT

Speed — 50 bps to 38.4 Kbps

Interface — Serial: RS-232 async; Parallel: IBM® PC and Centronics compatible

Connectors — Serial port: DB9 male; Parallel port: DB25 female

Power — Rechargeable nickel-cadmium battery; 7.5-VDC 100-mA adapter included

Size — 5.8"H x 3.8"W x 1.4"D (14.7 x 9.7 x 3.6 cm)

Weight — 0.8 lb. (0.4 kg), including battery

Save when you buy both BLACK FOX and BOB-CAT-B!
Black Fox and BOB-CAT-B
DT395A-R2
$720.00

BOB-CAT-B (Breakout Box Cable Analyzer):

Package Includes — (2) 4-foot, dual-gender Y-extension cables, and (4) jumper wires, manual, and hard case

Switches — (30): (5) Special-function, (25) lead enable/disable

Test Points — (2) rows of 25-position gold-plated jumper terminals

Interface — RS-232

Connectors — (1) DB25 male, (1) DB25 female

Indicators — (100) LEDs: (50) Red, (50) Green

Power — (1) 9-volt battery (included)

Size — 1.5"H x 3.5"W x 5.8"D (3.8 x 8.9 x 14.7 cm)

Weight — 0.7 lb. (0.3 kg)

Item	Code	Price
Black Fox	DT390A-R2	**$510.00**
BreakOut™ Box Cable Analyzer/Tester Model B (BOB-CAT-B)	TSW81A	**$249.00**
Loopback Module	TSW85A	**$35.90**
Additional Jumpers (Set of 4)	TSJ03	**$20.50/set**
DB9 Adapter (Male or Female)	TS012A-M/F	**$20.45**
DB15 Adapter (Male or Female)	TS013A-M/F	**$20.45**

- **Tests cables for continuity and configuration.**
- **Full monitoring and testing for RS-232 applications.**
- **Connects easily to leads or other test equipment.**
- **Optional Loopback Module tests installed cable.**
- **Comes with detailed manual and RS-232 guide.**

Test cable connections between your PC and any RS-232 device with the BLACK BOX® BOB-CAT-B. Find cable shorts or opens in a flash. Check pinnings to see what type of cable you need to connect two devices.

You get all the features you need for complete RS-232 testing—DIP switches to open and close lines between the 50 patch points, and 100 LEDs (50 red, 50 green). BOB-CAT-B's unique patching system makes it easy to attach other testers like an oscilloscope or ohmmeter.

Use with Black Fox for the perfect combination to test all your RS-232 hardware and software.

Our Complete Family of RS-232 Testers—with the Features You Need.

232 Monitor Basic

Basic Testing Made Easy and Affordable.

- Async only.
- Six keys.

Item	Code	Price
232 Monitor Basic	DT100A	**$625.00**

232 Monitor

An Unbeatable Price for a Hand-held Data-Line Troubleshooter.

- Sync or async.
- Six keys.

Item	Code	Price
232 Monitor	DT150A	**$1330.00**

232 Monitor Plus

PLUS
Now includes a 102-LED Breakout Box FREE!!

All the Features of PC-Based Testers in a Handheld Unit.

- Sync or async.
- Full QWERTY keyboard plus directional keypad.

CE Approval — 230-VAC version: DT200AE

Item	Code	Price
232 Monitor Plus	DT200A	**$2355.00**

BUYER'S GUIDE

FOR COMPARISON: RS-232 TESTERS

Feature	232 Monitor Basic	232 Monitor	232 Monitor Plus
Keyboard Layout	6 keys	6 keys	Full QWERTY keyboard
Display	2 rows of 40 characters	2 rows of 40 characters	8 rows of 30/40 characters
On-Line Help	No	No	Yes (printable)
Remote Control	No	No	Complete realtime monitoring; testing from remote site
Protocol	Async	Sync, async monosync, BBC, isochronous	Sync, async monosync, BBC, isochronous
Autoconfiguration	Data rate, framing, parity	Data rate, framing parity	Protocol, data rate, framing parity (one keystroke)
Data Rates	150 bps to 38.4 Kbps	Async: 75 bps to 57.6 Kbps; Sync: 75 bps to 64 Kbps	Async: 75 bps to 57.6 Kbps; Sync: 75 bps to 64 Kbps
Data Display Codes	ASCII, Hex, EBCDIC	ASCII, Hex, EBCDIC, IPARS, Baudot	ASCII, Hex, EBCDIC, IPARS, Baudot
Parity	Odd, even, none	Odd, even, none	Odd, even, none
NVR RAM Size	32 KB	32 KB	128 KB
Go to Location	Yes	Yes	Yes
Interface Signals Captured	DSR, RTS, CTS, DCD, RI, DTR	DSR, RTS, CTS, DCD, RI, DTR	DSR, RTS, CTS, DCD, RI, DTR
Data Encoding	NRZ	NRZ, NRZI, FM0, FNM1	NRZ, NRZI, FM0, FNM1
User Selections	TXD/RXD buffer, user-defined strings, ASCII, HEX 0-Off, space, mark, alternating bits, Fox 1/2	TXD/RXD buffer, user-defined strings ASCII, HEX 0-Off, BERT space, mark, alternating bits, Fox 1/2	TXD/RXD buffer, user-defined strings, ASCII, HEX 0-Off, BERT space, mark, alternating bits, Fox 1/2
Connectors	(1) DB25 M, (1) DB25 F	(1) DB25 M, (1) DB25 F	(1) DB25 M, (1) DB25 F
Trigger Capabilities	Start capture	Start/Stop capture, Auto Retrigger (Snap)	Start/Stop capture, Auto Retrigger (Snap)
Trigger Options	String on TD, String on RD	TD/RD: String data, Any data, Interface signal pattern	TD/RD: String data, Any data, Interface signal pattern
Bit Error Rate Tests	Yes	Yes, and performance	Yes, and performance
Performance/ Response Measurement	No	Yes	Yes to 999,999,999 bytes
Stop Bits	1, 2	1, 1.5, 2	1, 1.5, 2
Status Messages	ON, OFF	Normal, Long, Short, OFF	Normal, Long, Short, OFF
Power	(1) 9-VDC alkaline battery or wall transformer (both included) for all models		
Size	1.3"H x 8"W x 5"D (3.3 x 20.3 x 12.7 cm)	1.3"H x 8"W x 5"D (3.3 x 20.3 x 12.7 cm)	1.4"H x 9.3"W x 5.5"D (3.6 x 23.6 x 14 cm)
Weight	1.2 lb. (0.5 kg)	1.2 lb. (0.5 kg)	1.4 lb. (0.6 kg)

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Portable Cable Analyzer/Tester (P-CAT)

Get Quick Results with Either Manual or Automatic Scanning of DB25 Cables.

- **Easy DB25 cable testing.**

Test all 25 connections quickly or one by one—it's your choice. Set P-CAT for SCAN mode, and it will automatically test each cable lead for opens, shorts, and continuity. Set it for STEP mode, and you can manually test each lead, one at a time.

Test already installed cable with the included Bounce-Back Module. P-CAT can send a signal from one end of the line to its Bounce-Back Module at the other end, so you don't have to be in two places at one time. And you get your reading fast.

A 9-volt battery and an adapter are included.

SPECIFICATIONS

Controls — (1) OFF/STEP/SCAN switch, (1) STEP pushbutton switch

Interface — RS-232

Connectors — P-CAT: (2) dual-gendered DB25 connectors on 2-inch (5.1-cm) ribbon cable; Bounce-Back Module: (1) dual-gendered connector on 2-inch (5.1-cm) ribbon cable

Indicators — (53) LEDs: 25 per side, Continuity, Short, Open

Power — (1) 9-volt battery with optional 9-VDC adapter

Size — P-CAT: 1.5"H x 3"W x 5.5"D (3.8 x 7.6 x 14 cm); Bounce-Back Module: 1"H x 3"W x 3.3"D (2.5 x 7.6 x 8.4 cm)

Weight — P-CAT: 0.5 lb. (0.2 kg); Bounce-Back Module: 0.1 lb. (<0.1 kg)

BLACK BOX
Cable Tester
OPEN
CONT
SHORT
OFF
SCAN
STEP
PIN GND

Item	Code	Price
Portable Cable Analyzer/Tester (P-CAT)	TSW75A	**$305.00**
Optional 9-volt AC/DC Adapter	PS175	**$12.30**

232 BERT • V.35 BERT

Identify Modem and Line Problems—Then Read the Results Right on the LCD.

- **Quick, reliable testing for RS-232 or V.35.**
- **Four-digit liquid-crystal display (LCD).**
- **Color-coding for easy test setup.**

Does the phone-company repairman live in your office? Send him home and diagnose your own transmission problems with one of our BERTs.

Keep all the tests you need right in your toolbox—both BERTs give you industry-standard loopback testing patterns. And you can check rate calculations on the convenient 4-digit LCD.

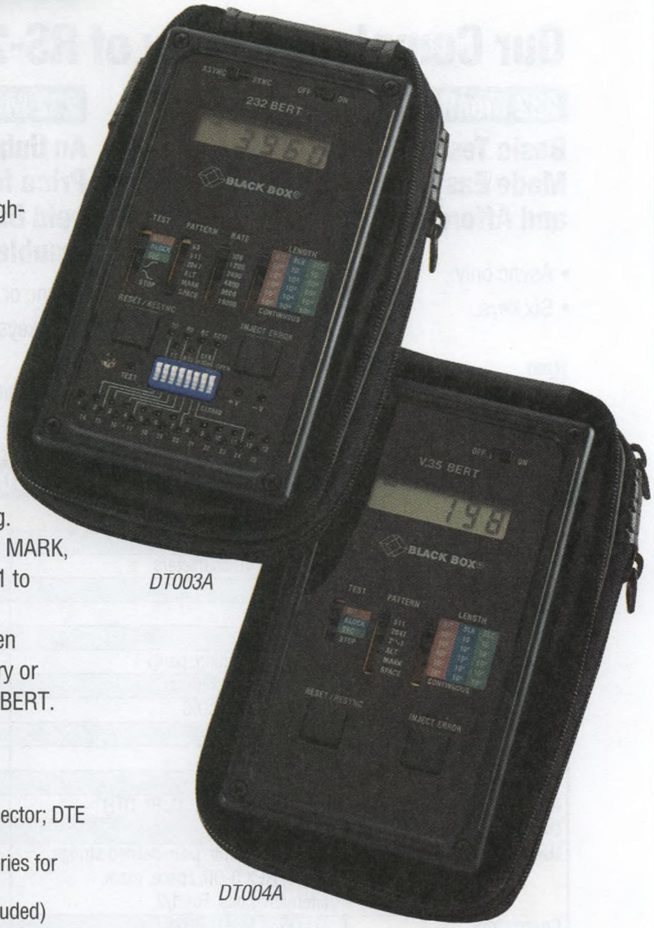
Color-coding of all test functions and switch options makes your tests quick and easy.

232 BERT is a reliable way to diagnose RS-232 transmission problems, either sync or async, with speeds of 300 bps to 19.2 Kbps.

V.35 BERT finds faults fast in your high-speed DDS link, with test speeds up to 2.048 Mbps.

Your battery of tests for the RS-232 tester includes bit-error-rate and block-error-rate testing (BERT and BLERT), errored seconds, number of bits of either polarity on any RS-232 pin, and error introduction on lines. Initiate tests on your modem or line-driver link and connect two BERTs for full-duplex testing. Test data patterns of 63, 511, 2047, ALT, MARK, and SPACE. Test message lengths from 1 to "continuous."

Dual power makes the V.35 tester even more adaptable: Use either a 9-volt battery or the AC adapter that comes with the V.35 BERT.


DT003A

DT004A

SPECIFICATIONS

Error Rate Display — 4-digit LCD with overflow and test-state indications

RS-232 Breakout Functions — 232 BERT: Jumper post to access all 25 RS-232 pins;
DIP switches open/close the most-used pins of the RS-232 interface

Speed — 232 BERT: 300 bps to 19.2 Kbps;
V.35 BERT: Up to 2.048 Mbps, set by external clock

Interface — 232 BERT: RS-232, V.24, male and female connectors on attached ribbon cable; Normal configuration as DTE device;
V.35 BERT: Synchronous V.35 male connector; DTE

CE Approval — DT003A

Power — 232 BERT: (2) 9-volt alkaline batteries for over 100 hours of continuous use;
V.35 BERT: Plug-in AC transformer (included) or (2) 9-volt alkaline batteries

Size — 7"H x 4.5"W x 2"D (17.8 x 11.4 x 5.1 cm)

Weight — 232 BERT: 1.1 lb. (0.5 kg);
V.35 BERT: 2.1 lb. (1 kg)

Item	Code	Price
232 BERT	DT003A	**$405.00**
V.35 BERT	DT004A	**$815.00**

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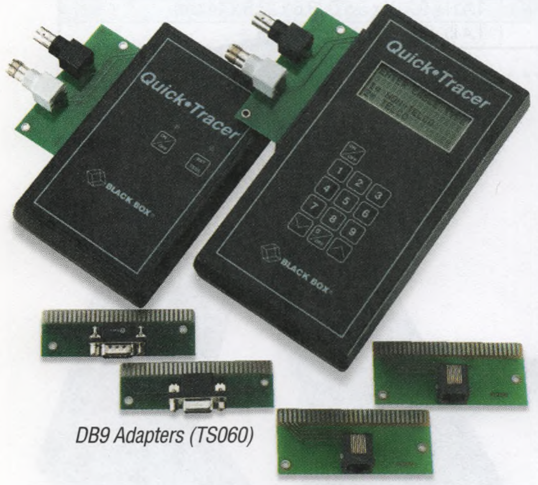
Quick Tracer

The One Tester for Every Popular Cable!


DB9 Adapters (TS060)

RJ-45 Adapters (TS070)

Quick Tracer Transmitter (left) and Receiver (right) with BNC/TNC WANG Compatible Adapters (TS067) inserted.

- **Tests *any* copper-conductor data cable.**
- **Displays test results in plain English on a liquid crystal display (LCD) screen.**

Test any copper-conductor data communications cable from DB25 to Token Ring. The Quick Tracer tells you which connectors have continuity. Once you know the cable configuration, you can easily find shorts or breaks.

The Quick Tracer Kit (TS016A) and the appropriate Adapter are all you need (order only the Adapters you will really use). The Kit includes a transmitter and a receiver. Attach the transmitter to one cable end, and the receiver to the other. That's all—you're ready. You can test cable that's installed or still on the spool.

An optional Carrying Case is available to keep all your Quick Tracer equipment together.

SPECIFICATIONS

Connectors — 64-Conductor, flat-edge

Indicators — Transmitter LEDs: Power, Low power; Receiver LCDs: Test data, Low-power message

Power — 9-volt, 0.25-A battery

Size — Transmitter: 1.3"H x 3.6"W x 5.8"D (3.3 x 9.1 x 14.7 cm);
Receiver: 1.2"H x 4"W x 7.5"D (3 x 10.2 x 19.1 cm)

Weight — 1.8 lb. (0.8 kg)

FAXBACK INFORMATION
Request Document Number: 14876
Call 412-746-5500 Anytime

Item	Code	Price
Quick Tracer	TS016A	**$450.00**
Adapters		
DB9	TS060	**$36.90**
DB15	TS061	**$40.00**
DB25	TS062	**$40.00**
DB37	TS063	**$45.00**
Centronics® 36	TS064	**$45.00**
Telco 50	TS065	**$56.00**
BNC/TNC (WANG® Compatible)	TS067	**$68.00**
RJ-12	TS069	**$36.90**
RJ-45	TS070	**$45.00**
4-Wire Utility	TS071	**$34.85**
BNC	TS072	**$60.00**
Token Ring	TS073	**$101.00**
50-Pin Header	TS074	**$47.00**
Carrying Case	TS068	**$25.60**

$ave over $100

when you buy Quick Tracer with all its accessories!

Item	Code	Price
Quick Tracer Kit	TS025A	**$1030.00**

Complete Fiberoptic Testing.

Fiber Solution Kit

Troubleshoot and Test Fiberoptic LAN Cable and Equipment.

- **Locate and identify problems by yourself without the need for a consultant!**
- **Kit accurately tests all fiber Ethernet, Token Ring, and FDDI networks—within one hundredth of a dB.**

Test fiberoptic LAN equipment and cable *resolution*—to within one hundredth of a dB. This kit generates **both 850- and 1300-nm wavelengths**.

With the Fiber Solution Kit, once you locate problems, you can solve most of them yourself. If not, you can tell the consultant exactly where the problem is—and minimize the bill.

The Kit includes a fiberoptic power meter (FiberEye) and a fiberoptic light source (FiberLight). It accurately measures the amount of light injected into or emerging from the network so you can check the installation and operation of your cable. You can even identify faulty patch cables or bad splices, couplers, or connectors.

This tester is simple to use. Just press the "LAN" button to select network type. Then connect the component you want to test. The tester does the rest, and the LCD shows the results.

850nm
Ethernet
Token Ring
1300nm
FDDI
ON/OFF
LAN
ID
BLACK BOX®
FiberLight
-19.89 dBm
LAN
MEM
dBm
BLACK BOX®
FiberEye

SPECIFICATIONS

Battery Life — FiberEye: 100 hours; FiberLight: 8 hours
Dynamic Range — 3 to -55 dBm
Wavelength — 850, 1300 nm
Power — (2) AA batteries (installed)
Size — 1"H x 2.4"W x 5.5"D (2.5 x 6.1 x 14 cm)
Weight — 1.2 lb. (0.5 kg)

Use the Kit to:

- Test fiber LAN cable and components.
- Install cable and components.
- Locate faults.
- Do regular maintenance.

FAXBACK INFO
Request Document Number: 15932
Call 412-746-5500
Anytime

Item	Code	Price
Fiber Solution Kit	TS650A	**$1595.00**

PLUS! Modular Testers, **see pp. 203–204.**

RX
VOLUME
TX
POWER
dBm
FIBER TALK'N TEST
BLACK BOX®
RX
POWER
TX
dBm
POCKET FIBER TESTER
BLACK BOX®
POWER
POCKET OPTO SOURCE
BLACK BOX®

Left to right: Fiber Talk'n Test, Pocket Fiber Tester, and Pocket Opto Source.

- **Test Fiberoptic Cable with ST or SMA Connectors.**
- **Fiber Talk'n Test lets you talk to your partner while you test.**
- **Pocket Fiber Tester provides inexpensive fiber testing.**
- **Pocket Opto Source provides a light source for testing.**

FAXBACK INFO
For TS051A or TS055A: 10102
Call 412-746-5500
Anytime

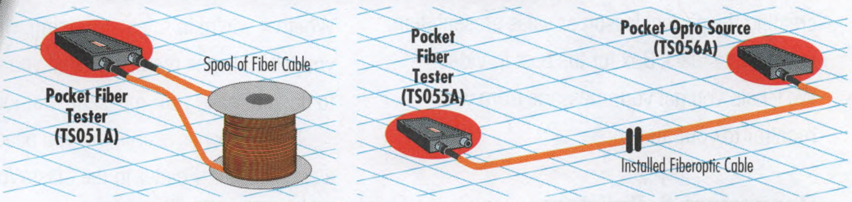
SPECIFICATIONS

Output Wavelength — 850 n ± 15 nm at ± 3 dBm
Power Output —
-20 dBm ± 0.5 dBm (100µ-core fiber);
-23 dBm ± 1 dBm (62.5µ-core fiber);
-26 dBm ± 1 dBm (50µ-core fiber)
Readout Range — -22 dBm to -40 dBm
Readout Resolution — 2 dBm
CE Approval — All items listed are approved
Connectors — TS054A: (2) ST®, (1) RJ-11;
TS053A: (2) 905 SMA, (1) RJ-11;
TS055A: (2) ST;
TS051A: (2) 905 SMA;
TS056A: (1) ST;
TS052A: (1) 905 SMA
Indicators — PWR, Bar-graph-style LED in 2-dBm increments
Power — 9-volts, supplied by alkaline or nickel-cadmium transistor battery
Size — 4.5"H x 2.3"W x 1"D (11.4 x 5.8 x 2.5 cm)
Weight — 0.3 lb. (0.1 kg), including battery

Fiber Talk'n Test • Pocket Fiber Tester • Pocket Opto Source

Talk to Your Partner while You Test Your Fiber Cable.

Test Cable That's Still on the Spool or Installed.


Pocket Fiber Tester (TS051A)
Spool of Fiber Cable
Pocket Fiber Tester (TS055A)
Pocket Opto Source (TS056A)
Installed Fiberoptic Cable

The **Fiber Talk'n Test** not only enables you to test installed fiberoptic cable or a new cable spool, but you can also communicate with your partner at the same time. The same line you're testing carries messages to your partner.

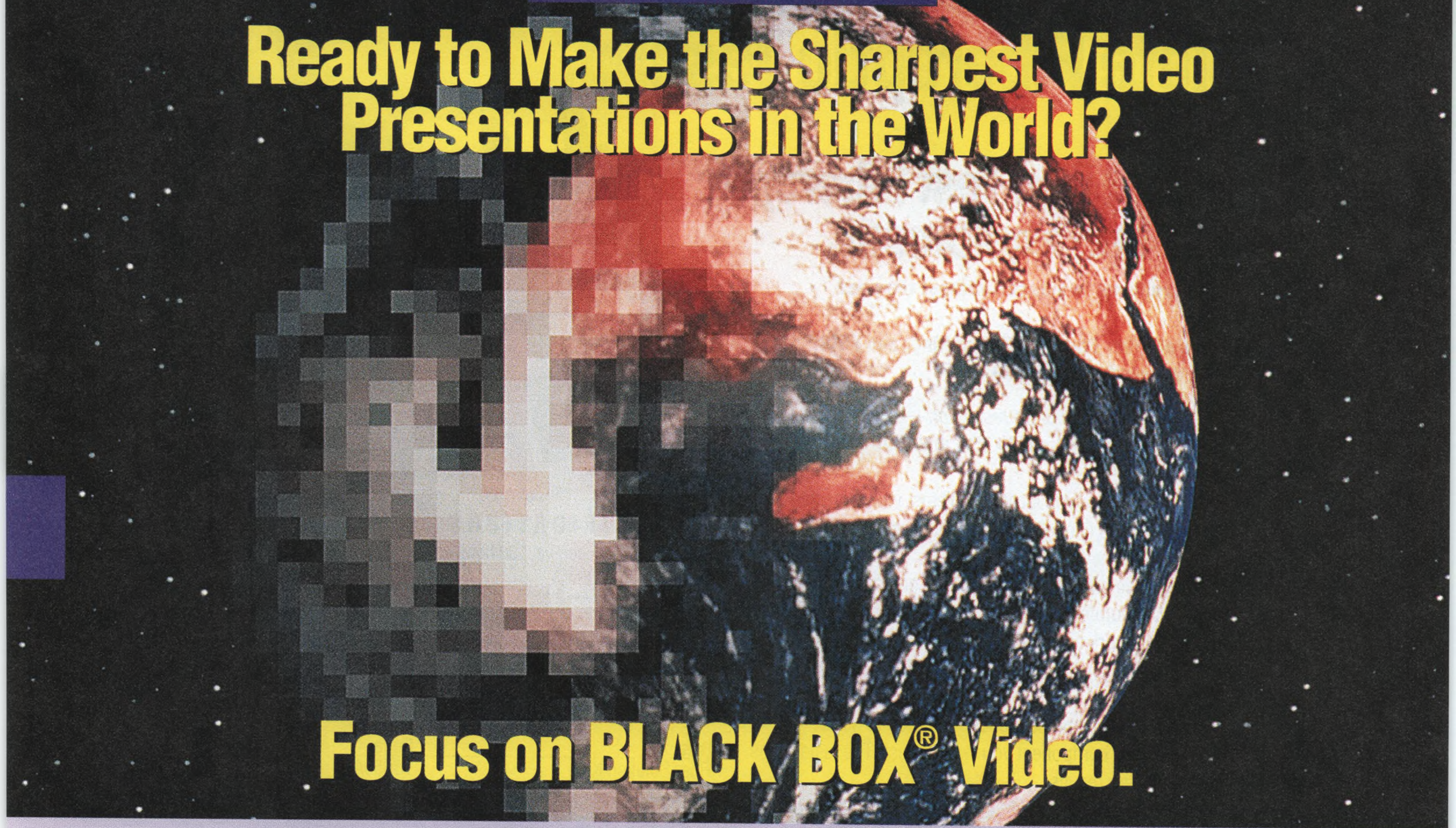
The **Pocket Fiber Tester** also tests for continuity on your fiberoptic cable. It generates an **850-nm wavelength** only. The Tester works with these fiberoptic cables: multimode; 50-, 62.5-, and 100-micron; single, duplex, or bundled.

To test cable that's already installed, use a **Pocket Opto Source** with a Pocket Fiber Tester. Send a beam of light from your Opto Source down the cable so someone at the other end can receive the signal in the Tester.

Both Testers and the Opto Source work on multimode cable.

NOTE: Fiber Testers are for use with glass-core fiberoptic cable only.
NOTE: Fiber Talk'n Test must be used in pairs.

Item		Code	Price
Fiber Talk'n Test	ST	TS054A	**$360.00**
	SMA	TS053A	**$360.00**
Pocket Fiber Tester	ST	TS055A	**$310.00**
	SMA	TS051A	**$310.00**
Pocket Opto Source	ST	TS056A	**$180.00**
	SMA	TS052A	**$180.00**



Ready to Make the Sharpest Video Presentations in the World?

Focus on BLACK BOX® Video.

Make Your Video Presentations Look Out of This World.

Launch eye-catching video presentations right from your computer. You've spent the time creating the perfect lesson or sales presentation, now turn to Black Box for the best in Video. We'll help you get your message from your monitor to your audience.

Converters & Splitters.

With a BLACK BOX® Video Converter (**pages 218–222**) you can display computer-generated graphics on a TV, video monitor, or professional audio/video studio equipment. Get your message out to *every* possible audience!

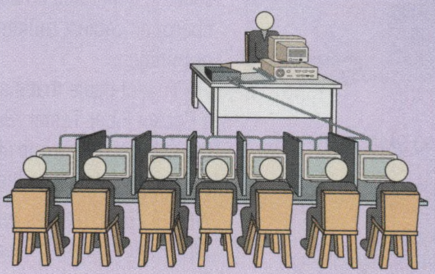
And if you want to share video spreadsheets, pie charts, or other graphics in meetings or presentations, see our Video Splitters (**pages 224–226**). Display graphics from your PC to as many as 12 monitors.

Presentation Tools.

If it's your job to get in front of a roomful of people and hold their attention, these BLACK BOX® Presentation Tools (**pages 230–233**) are for you. Whether you're in sales or training, we can help you tell audience members what you want them to do and make your message memorable.

Black Box has everything you need from a simple Laser Pointer to the ClassWork Plus interactive classroom solution.

Now your work can truly be interactive. Show everybody how you do it!



Extenders.

Dirt. Moisture. Electromagnetic fields. And theft. These aliens are the enemies of your CPUs. Put your CPUs in a safe, secure place—and place your monitors where they're most convenient—with BLACK BOX® Video Extenders (**pages 227–229**).

With Extenders, you can drive your video signals to audiences up to 700 feet away from your CPU. Your message will have tremendous reach!

CD-ROM.

Make the jump to light speed. Each of our CD Towers now has 12X speed drives. And, as always, you can access all drives in the Tower at once. No more waiting for the CD changer. Don't forget that everyone on your network can store and access *gigabytes* of reference and data resources!

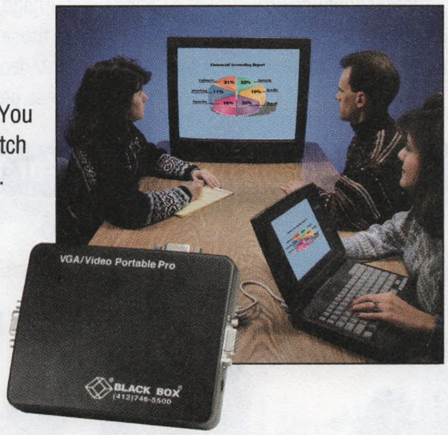
Find out about our CD Towers and other accessories for mass storage on **pages 234–239.**

VIDEO & MASS

BLACK BOX
SOLUTIONS

Same-Day Shipping.

"Next week I'm going on the road to do a number of sales presentations. I need a way to transmit images from my laptop to a TV. Can you help?"



Help is on the way! Our VGA to Video Portable Pro takes the video output from your PC, Mac®, or laptop and broadcasts text and graphics onto any TV or VCR. You can even work at your computer while your viewers watch your screen displayed on TVs or large-screen monitors. Just plug it into your computer. No software or extra memory is required.

Since we have same-day shipping, you'll receive your order *fast.* And you'll have plenty of time to rehearse with the Portable Pro before hitting the road.

BLACK BOX
SOLUTIONS

7000 Connectivity Solutions.

"Our office receives and produces a lot of information electronically. How can I archive the data and make it available to the entire network—without producing piles of printouts?"

You've come to the right place. Our RT4 CD-R Tower enables you to consolidate data from e-mail, databases, and multimedia presentations onto CDs. You can make the Tower the centerpiece of your archival system. Play back the CDs on any standard CD-ROM drive for yourself or your department. Or you can make copies for customers, colleagues, or suppliers. Its direct network link provides access for all valid users. And the mastering software you need to record CDs is included *at no extra cost!*

At Black Box we don't just sell computer hardware, we sell the solutions for your computing problems. Over 7000 solutions and counting!

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FOR *FAST* TECH SUPPORT,
Call **412-746-5500**, then...

PRESS **1,2,3** COMMUNICATIONS
Modems, CSU/DSUs, ISDN, T1, X.25/Frame Relay, Muxes/Line Sharing, Line Drivers, **Video & Multimedia**, PC Communications/Accessories

PRESS **1,2,4** LOCAL AREA NETWORK
High-Speed, Bridges and Routers, Remote Access, Wireless, Network Management, Ethernet, Token Ring, NetWare®, AppleTalk®, ARCNET®, **CD-ROM**

Or if You Prefer:
Fax Us at: 412-746-0746.
E-mail Us at: info@blackbox.com

Use a TV or VCR with Your Computer.

Create new and better ways to be seen with BLACK BOX® Video Converters.

Video Converters enable you to broadcast your PC display to a TV, VCR, or monitor up to 700 feet away! And with BLACK BOX® Video Converters, you always get sharp, colorful pictures with virtually no flicker.

Set up a video display on a large-screen TV in your lobby announcing personal greetings to customers and visitors. Because you can use a regular TV instead of an expensive large-screen computer monitor, you save money.

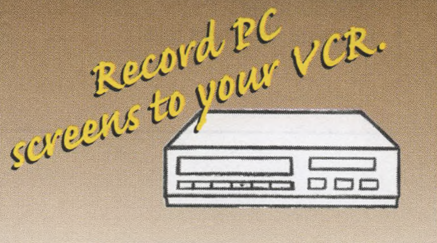
Fine-tune your presentations and record them on videotape for training, meetings, and truly professional multimedia sales presentations. Our Video Converters make it easy.

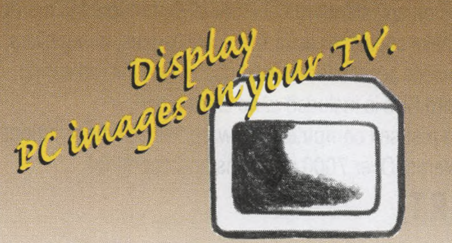
Change your image, and bring yourself closer to those who matter—with BLACK BOX® Video Converters. They make business personal.

There's Virtually No Limit to Creative Uses for Video Converters!

MAIN EVENT
Deli
Garden Spot
Today's Menu
Chicken and Mushrooms
Beef Stew
SOLD OUT
Company Announcements
Reminder: This year's company picnic is this Saturday at Washington Park.
Tuesday's Top Sales Person
Laura Jones

Save by Using a TV instead of an Expensive Monitor.
A computer is a fast and easy way to keep your customers up-to-date. Now you can use a TV instead of a computer monitor and save a bundle!


Record PC screens to your VCR.


Display PC images on your TV.

Control your presentations from your laptop.

Black Box Explains...

Video Conversion.

Video conversion is the process of translating computer video signals so they can be displayed on ordinary TV monitors, which use an otherwise incompatible standard.

Computer Video vs. TV Video

Computer video is scanned onto computer monitors much faster than ordinary TV video is scanned onto TV screens. In order to be read by the much slower TV monitor, both horizontal and vertical scanning have to be converted.

Quality Imaging

The very high resolution of computer monitors is necessary for applications such as spreadsheets, CAD, and other highly detailed graphics. However, many displays do look good on a TV, which is a far more economical alternative that's available nearly anywhere you travel.

With BLACK BOX® Video Converters, you get the high-quality hardware-based conversion you need for professional presentations. Unlike lesser products, displayed text is sharp and legible, and graphically complex images are displayed accurately and in their entirety.

Black Box Explains...

Selecting A Video Converter.

Resolution and Refresh Rate

Video boards for PCs come in a wide array of different resolutions and screen refresh rates, and they all have an effect on what kind of video converter you need.

One of the most important specifications of your video board is screen refresh rate. If you're unsure of the video board you will be connecting to, you want a converter that converts screen refresh rates up to 75 Hz. With low-end converters, if you connect to a video board with a vertical refresh rate of anything other than 60 Hz, you have to reconfigure the video board so it can send a 60-Hz vertical refresh signal.

Hardware Conversion vs. Software Conversion

Video converters can convert PC signals to video using hardware or software. Software conversion is cheaper than hardware conversion, especially where high quality and wide compatibility are not a priority. But conversion software can sometimes interfere with the graphics software you're using. So if you're going to use a software-based video converter, make sure your conversion software and your graphics and display software are compatible.

When you're using a variety of hardware and software, hardware-based units are your best options for video conversion.

Portability

If you'll be using your Video Converter for trade shows or other traveling presentations, consider portability carefully. You're not likely to want to carry a four-pound video converter through an airport, even if it does offer the best resolution. Instead, choose a converter like our VGA to Video Portable Pro, which offers many of the features of our professional models in a more compact package.

FAXBACK INFORMATION
Request Document Number: 18069
Call 412-746-5500 Anytime

Black Box Has the Video Converter for *Your* Application!

MORE!
Video Converters, see pp. 220–222.
VGA/Video Portable Pro
BLACK BOX (412)746-5500
VGA to Video Global
BLACK BOX (412)746-5500
BLACK BOX
Video Scan Converter II
ProVideo Converter
TECH SUPPORT'S PRODUCT OF CHOICE

AC331A AC333A Top: AC096A; Bottom: AC095A

Video Conversion on a Budget!

The VGA to Video Portable (AC311A) and the VGA to Video Portable Plus (AC321A) offer basic video conversion in a handy portable size, making them an economical choice for traveling presentations from a laptop computer. Because these Converters require software to operate, they can be inconvenient to move between PCs. Choose the AC311A for video only and the AC321A for both video and audio.

The Most for Your Money!

The New VGA to Video Portable II (AC325A), the VGA to Video Portable Pro (AC331A), and the VGA to Video Global (AC333A) are all great values, giving you the most features per dollar. Because they're hardware based, their picture quality is higher and operation is independent of the operating system—just plug them into any PC. And since they're portable, you can easily pack them with your laptop computer. Choose the AC331A for video only. Choose the AC325 for audio and video. Choose the AC333A for both audio and video and for international use.

Professional Converters for Demanding Applications.

The Video Scan Converter II (AC096A) and the ProVideo Converter (AC095A) are the best choice when highest quality and greatest compatibility are essential.

FOR COMPARISON: VIDEO CONVERTERS

Feature		VGA to Video Portable (AC311A)	VGA to Video Portable Plus (AC321A)	VGA to Video Portable Pro (AC331A)	VGA to Video Portable II (AC325A)	VGA to Video Global (AC333A)	Video Scan Converter II (AC096A)	ProVideo Converter (AC095A)
VGA Resolution/ Refresh Rate	640 x 480	60 Hz	60 Hz	66 Hz, 72 Hz	60 Hz	Up to 75 Hz	Up to 75 Hz	Up to 75 Hz
	800 x 600			56 Hz	60 Hz	60 Hz	Up to 75 Hz	Up to 75 Hz
	1024 x 768							Up to 75 Hz
Macintosh Resolution/ Refresh Rate	640 x 480			66 Hz		66 Hz	Up to 75 Hz	Up to 75 Hz
	832 x 624						Up to 75 Hz	Up to 75 Hz
	1024 x 768							Up to 75 Hz
Audio Input/Output			✓		✓	✓		
Software Independent				✓		✓	✓	✓
S-Video Output				✓		✓	✓	✓
RGB Output				✓		✓	✓	✓
Price		**$299.00**	**$399.00**	**$499.00**	**$249.00**	**$679.00**	**$1495.00**	**$1795.00**

VGA to Video Portable Pro

Our Most Popular Portable Converter Delivers Sharp, Steady Images.

- **Converts computer video for use on NTSC and PAL devices.**
- **Provides high-quality, hardware-based conversion.**
- **Small enough to take anywhere—use it for laptop-based presentations.**

This rugged little Converter from Black Box weighs less than half a pound, yet it turns your PC's VGA output signal into virtually flicker-free NTSC or PAL video.

You get super-clear resolution with up to 16 million vivid colors. Anti-flicker technology minimizes jitter and provides hotkey support for screen controls. With simultaneous VGA and video output, you get the convenience of viewing your PC screen while your audience watches the monitors. Choose from three models: All support Windows® or DOS, and come with all the cables you'll need for S-Video, VGA, and composite output.

The VGA to Video Portable Pro is made to work with both a PC and a Macintosh. It also supports RGBS and S-Video output, and you can transfer graphics and text from your PC onto any TV or VCR. No software is required.

FAXBACK INFORMATION
Request Document Number: 14326
Call 412-746-5500 Anytime

PC and Mac®

Also available:

The VGA to Video Portable Plus includes a clip-on mike and an audio input jack, so you can narrate your presentations or record audio onto a VCR demo tape. An additional RGB output port gives you the flexibility to broadcast the display to an RGB monitor or large-screen projection TV.

The VGA to Video Portable converts the VGA signal to a composite or S-Video signal—in either NTSC or PAL format. You get brilliant, flicker-free resolution.

SPECIFICATIONS

Hardware Requirements — IBM® PC 386 or greater; Apple Macintosh or compatible supporting standard Macintosh display mode (640 x 480, 31.5 or 35 KHz)
Resolution — NTSC: Up to 640 x 480; PAL: Up to 800 x 600
Video Input — From VGA card or CRT port of notebook computer
Video Output — NTSC or PAL (selectable); S-Video, VGA pass-through; RGB (requires separate cables)
CE Approval — AC331A and 230-VAC versions—AC331AE, AC321AE, AC311AE
Power — 115 VAC, 60 Hz, 12 watts
Size — 4"H x 5.5"W x 1"D (10.3 x 12.9 x 2.6 cm);
Weight — 0.3 lb. (0.1 kg)

VGA/Video Portable Pro
BLACK BOX
(412)746-5500

Check-Out the Savings!

The "old" way:

20" Video Monitor	*$1,500*

The Black Box way:

VGA to Video Portable Pro	*$499*
20" Color TV	*$350*
Total	*$849*

Save Over $600 NOW!

NOTE: Special-order RGB Output Cables are available. Call Tech Support for more information.

Item	Code	Price
VGA to Video Portable Pro	AC331A	**$499.00**
You may also be interested in:		
VGA to Video Portable Plus	AC321A	**$399.00**
VGA to Video Portable	AC311A	**$299.00**

* * *

BLACK BOX
(412) 746-5500
VGA to Video
Portable II
New

- **Compact size.**
- **Built-in audio with microphone.**
- **Supports standard VGA mode.**
- **Switch between NTSC and PAL.**
- **DOS, Windows® 3.1, and Windows 95 software included.**
- **Interface powered.**

FAXBACK INFORMATION
Request Document Number: 18186
Call 412-746-5500 Anytime

VGA to Video Portable II

Reliable Video Conversion at a Great Price!

If you'd like to display graphics from your PC on a regular or big-screen TV, but you don't want to pay a fortune for a Video Converter, here's your answer.

The VGA to Video Portable II is not only low-cost, but also has a lot going for it. It provides clean conversion of standard VGA to video. Because it converts VGA to NTSC *or* PAL video, it works both in North America and overseas.

This Video Converter is small enough to be truly portable and, since it's interface-powered, it doesn't even demand its own power outlet.

Because the VGA to Video Portable II uses software and the power of your PC to convert video, it's most practical use is with a single PC. If you need a Video Converter that will regularly be used with different PCs, see our VGA to Video Global on **page 221.**

SPECIFICATIONS

Hardware Requirements — PS/2®; IBM® PC compatible, 286, 386, 486, or Pentium® with VGA display card; notebook computer with CRT port
Memory Requirements — 640K RAM
Resolution — NTSC up to 800 x 600; PAL up to 800 x 600
System Requirements — MS-DOS® 3.3 or higher; Microsoft® Windows 3.1 or Windows 95 optional
Video Input Standards — VGA analog from VGA card or CRT port of notebook computer
Video Output — NTSC or PAL (selectable); composite; S-Video; VGA signal passthrough
CE Approval — Yes
Power — From the interface
Size — 3.7"H x 2.2"W x 1.1"D (9.4 x 5.5 x 2.8 cm)
Weight — 0.2 lb. (0.1 kg)

Item	Code	Price
VGA to Video Portable II	AC325A	**$249.00**

VGA to Video Global

Expect Top-Flight Performance from Our *Best* Portable Video Converter!

- **Display images from your PC or Mac® directly to TV.**
- **NTSC/PAL switch plus dual-voltage power supply for international use.**
- **Video *and* audio capabilities.**
- **Converts PC images up to 800 x 600 resolution and 75 Hz.**

No matter where you go, our best portable scan converter works for you. The VGA to Video Global features a dual-voltage power-supply system and an NTSC/PAL switch for use in North America or in Europe. And it works in PC or Mac® environments. It's even small enough to fit in your carry-on luggage.

Frame-buffering technology eliminates the need for software and preserves the detail of your image. Built-in picture controls enable you to see the whole picture on any TV.

For professional picture quality, the Converter supports 75-Hz refresh rates—no need to compromise your computer monitor output. To illustrate particular points, use the built-in Zoom function. Enlarge areas on the screen with the touch of a single control.

The VGA to Video Global features audio capability, too! Use the clip-on mike and audio input jack to narrate presentations or add music to videotapes.

Financial Accounting Report
21%
22%
11%
10%
16%
20%
VGA to Video Global
BLACK BOX®
(412)746-5500
Our BEST Portable Converter

VGA to Video Global travels right along with you and your laptop computer so you can give presentations anywhere there's a TV—even overseas. This top-quality video scan converter is CE approved and is compatible with the European PAL standard.

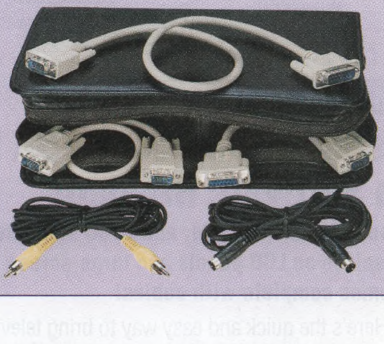
SPECIFICATIONS

Hardware Requirements — VGA or Mac video output
Video Input — VGA to 800 x 600; Mac to 640 x 480
Video Output — NTSC or PAL (selectable); S-Video, VGA passthrough, RGB (requires separate cables)
CE Approval — Yes
Power — 100–240 VAC, 50–60 Hz, 2 Amps
Size — 1"H X 6.3"W X 4.5"D (2.5 x 16 x 11.4 cm)
Weight — 0.6 lb. (0.3 kg)

Everything You Need to Take Your Converter on the Road.

Included with the VGA to Video Global and the VGA to Video Portable Pro (page 220):

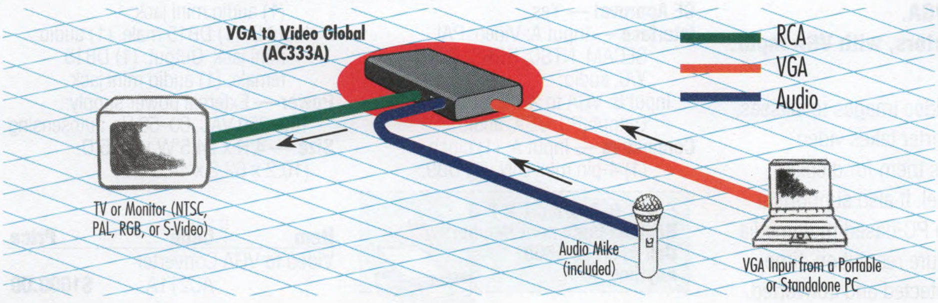
- Traveling Case
- Composite Cable
- S-Video Cable
- PC Cable
- (2) Mac Cables



The AC333A also includes a dual-voltage power adapter.

FAXBACK INFORMATION
Request Document Number: 16706
Call 412-746-5500 Anytime

PC and Mac®


VGA to Video Global
(AC333A)
RCA
VGA
Audio
TV or Monitor (NTSC, PAL, RGB, or S-Video)
Audio Mike (included)
VGA Input from a Portable or Standalone PC

Item	Code	Price
VGA Video Global	AC333A	$679.00

ProVideo Converter • Video Scan Converter II

Professional-Quality Presentations from Nearly Any Computer.

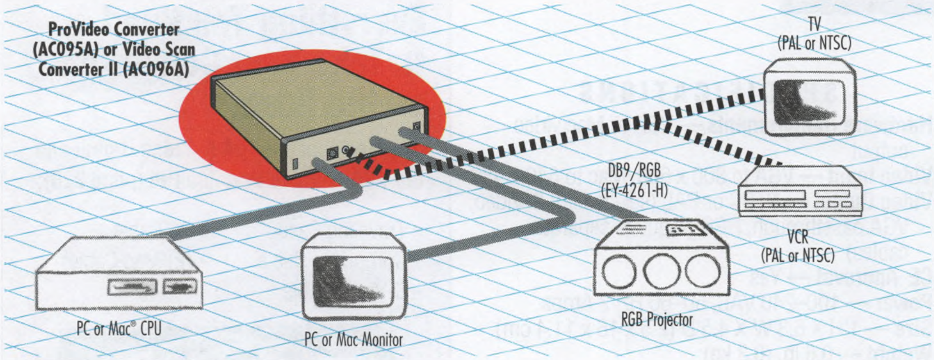
These Top-of-the-Line Video Converters Have the Widest Range of Compatibility—and Refresh Rates up to 75 Hz!

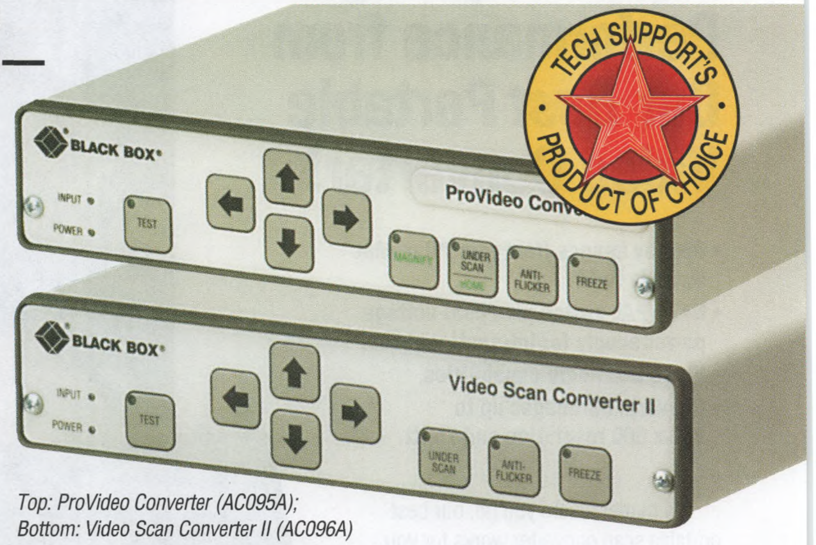
- **Supports a wide range of resolutions and refresh rates.**
- **Built-in microprocessor for optimum picture quality.**
- **Front-panel image positioning, and built-in test patterns help you get the most from your TV.**
- **Operates independently of software drivers—Windows®, OS/2®, DOS, Mac® System 7™, UNIX®.**
- **Full 24-bit color sampling and video encoding. Supports 16.8 million colors.**

These professional-quality video scan converters deliver consistent, sharp, steady video through even the most intensive use. And they're compatible with nearly any PC or video board, making them ideal whenever you're not sure of what you'll be connecting to. For trade shows, for important presentations, anytime you need flawless performance, you need a BLACK BOX® ProVideo Converter or Video Scan Converter II. See the chart on **page 219** to compare the different types of Video Converters.

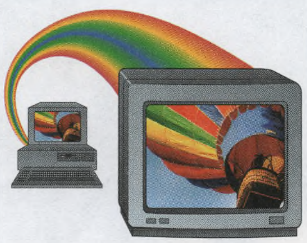
The **ProVideo Converter** supports Mac and noninterlaced VGA input at resolutions of 1024 x 768. Plus, it supports noninterlaced VGA output (800 x 600) and Mac output (832 x 624). At the touch of a button, you get magnification, which enlarges images 150% for easy viewing.

Video Scan Converter II supports noninterlaced VGA resolutions up to 800 x 600 and Mac resolution up to 832 x 624. Each Converter has four outputs: computer monitor, composite, S-Video, and 15-KHz RGB.


ProVideo Converter (AC095A) or Video Scan Converter II (AC096A)
TV (PAL or NTSC)
DB9/RGB (EY-4261-H)
VCR (PAL or NTSC)
RGB Projector
PC or Mac® CPU
PC or Mac Monitor


TECH SUPPORT'S PRODUCT OF CHOICE
BLACK BOX®
INPUT
POWER
TEST
ProVideo Converter
MAGNIFY
UNDER SCAN
ANTI-FLICKER
FREEZE
Video Scan Converter II

Top: ProVideo Converter (AC095A); Bottom: Video Scan Converter II (AC096A)



SPECIFICATIONS

Output — PAL or NTSC, switch-selectable

Resolution — AC095A: Up to 1024 x 768 for Mac and PC; AC096A: 800 x 600 for PC; Up to 832 x 624 for Mac

CE Approval — All items listed are approved

Connectors — Inputs: VGA: DB15HD; Mac: DB15; Outputs: VGA: DB15HD; Mac: DB15; S-Video: 4-pin mini DIN; Composite: RCA®; RGB: DB9F

Power — 95–250 VAC, 50–60 Hz, autosensing

Size — AC095A: 1.5"H x 7.3"W x 10.8"D (3.8 x 18.5 x 27.4 cm); AC096A: 1.5"H x 7.3"W x 6.3"D (3.8 x 18.5 x 16 cm)

Weight — AC095A: 4 lb. (1.8 kg); AC096A: 3 lb. (1.4 kg)

FAXBACK INFORMATION
Request Document Number: 16029
Call 412-746-5500 Anytime

Item	Code	Price
ProVideo Converter	AC095A	**$1795.00**
Video Scan Converter II	AC096A	**$1495.00**
You may also need...		
DB9/RGB Cable, 12-ft. (3.7 m)	EY-4261-H	**$95.00**

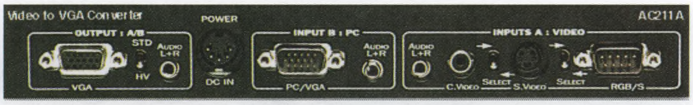
◆ ◆ ◆

Video to VGA Converter

Display TV on Your VGA Monitor—No Software Needed!

- **Converts PAL, SECAM, and NTSC standards to VGA.**
- **Displays on LCD panels and large-screen projectors, with VGA input.**
- **Comes complete with cables!**

Here's the quick and easy way to bring television video images to classes, conferences, and multimedia presentations. The Converter takes video images from your TV, VCR, or camcorder and converts them for display on a VGA monitor, video projector, or LCD display panel. It also supports a secondary input channel you can switch to and receive PC-based multimedia (VGA/stereo) signals. Composite-video standards, picture resolution, time-base correction, and line doubling are automatically detected and converted.


Video to VGA Converter
AC211A
OUTPUT : A/B
STD
HV
AUDIO L+R
VGA
POWER
DC IN
INPUT B : PC
PC/VGA
INPUTS A : VIDEO
C.VIDEO
SELECT
S.VIDEO
RGB/S

SPECIFICATIONS

CE Approval — Yes

Interface — Input A: Video: PAL, SECAM, NTSC, RGBS, RGB, Y/C, audio; Input B: VGA to XGA®, audio; Output: PC: VGA, audio

Connectors — Input A: (1) cinch, (1) 4-pin mini DIN, (1) DB9, (1) audio mini jack; Input B: (1) DB15 male, (1) audio mini jack; Output: (1) DB15 female, (1) audio mini jack

Power — External power supply: 100–250 VAC, 60–50 Hz, autosensing

Size — 4"H x 24.5"W x 17.5"D (10.2 x 62.2 x 44.5 cm)

FAXBACK INFO
Request Document Number: 13600
Call 412-746-5500 Anytime

Item	Code	Price
Video to VGA Converter	AC211A	**$1600.00**

We Have Switches for *All* Video Standards!

RGBS
Up to 4 Monitors

VGA & Super VGA
Up to 6 Monitors

PS/2® & VGA
Up to 6 CPUs

PC & VGA
Up to 6 CPUs

Macintosh®
Up to 12 CPUs

PC & CGA/EGA
Up to 6 CPUs

CGA & EGA
Up to 6 Monitors

The video switches listed can be found on pages 292–293.

MORE! Video Switches **see pp. 270–293.**

When you need to share video images or switch multiple video signals from a single location, you need a BLACK BOX® Video Switch. No matter what video standard you use, Black Box has the right Switch—you'll find more video switches in the *BLACK BOX® Catalog* than you'll find anywhere else.

To see the entire line of BLACK BOX® Video Switches, turn to **pages 270–293**. Be sure to pay special attention to our best-selling Serv Series Switches on **pages 270–287**. And if you don't see the switch you need—or if you have questions—call our Technical Support Experts. They can recommend a video switch and can even help you track down or customize a switch for an unusual application.

Most BLACK BOX® Video Switches are in stock and ready to ship today. If you need your Video Switch tomorrow, just call us today!

PLUS! Serv Switches **see pp. 270–287.**

Video Switches (S-Video 8 to 1, Composite 8 to 1)

Centralize High-End Video from up to 8 Devices.

- **Full 30-MHz bandwidth.**
- **Plug-and-play installation.**
- **Remote-control unit included.**

You can consolidate images from up to eight S-VHS, Hi-8, or ED-BETA video sources into one location with BLACK BOX® Video Switches.

With just one touch of a button, your TV, monitor, or projector is ready to receive the video input signal from any of eight separate video sources.

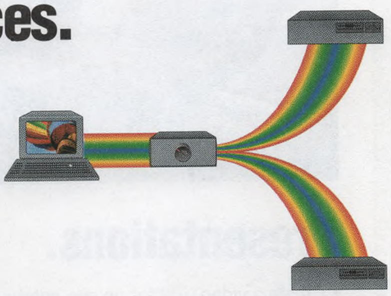
Use the S-Video Switch 8 to 1 for video sources with 4-pin mini DIN connectors. Use the Composite Switch 8 to 1 for video sources with BNC connectors.

Both Switches include a hard-wired remote control to handle switching from up to 1000 feet (305 m) away.

If you need to *send* your signal to eight—or more—monitors, see our Video Splitters, featured on **page 225–226**.

FAXBACK INFORMATION
Request Document Number: 12001
Call 412-746-5500 Anytime

SELECTED INPUT
FLASHING—NO INPUT SIGNAL
BLACK BOX®
SVHS Switch 8 to 1
INPUT
7
8



SPECIFICATIONS

Bandwidth — 30 MHz
Connectors — AC041A: (9) 4-pin mini DIN female; AC042A: (9) BNC female
Indicators — Numerical LED
Power — 9 VDC, 500 mA
Size — 1.7"H x 7"W x 6.5"D (4.3 x 17.8 x 16.5 cm)
Weight — 3 lb. (1.4 kg)

Item	Code	Price
S-Video Switch 8 to 1	AC041A	**$564.00**
Composite Switch 8 to 1	AC042A	**$429.00**
To connect your S-Video Switch, order our:		
S-Video Splitter (8-Channel)	AC043A	**$495.00**
S-Video Cable		
6-ft. (1.8-m)	EHN058-0006	**$15.00**
12-ft. (3.7-m)	EHN058-0012	**$20.00**
To connect your Composite Switch, order our:		
Composite Splitter (8-Channel)	AC044A	**$429.00**

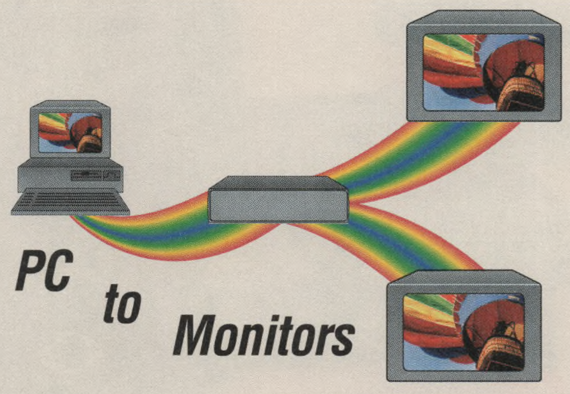
remember to order **cables**

Display a Single Video Signal on up to 12 Computer Monitors.

Video Splitters enable you to take a single video signal from your PC and split it into two or more signals to two or more monitors. This ability makes Video Splitters invaluable for applications in education, sales, industry, and advertising.

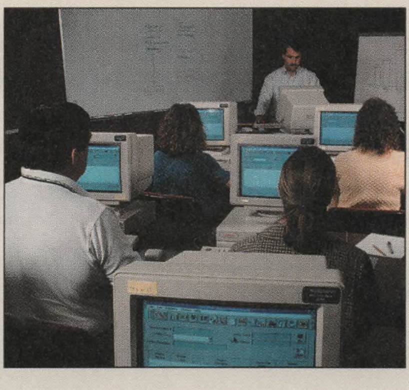
A Video Splitter reamplifies the video signal in order to divide it without losing quality. Each port has its own video drivers for individual gain and impedance compensation so each port is totally independent of the others—locate monitors at varying distances and get optimum quality on each.

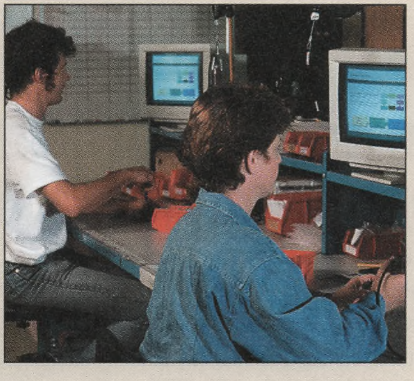
Because a Video Splitter reamplifies the video signal, it also acts as a short-range video extender. A normal video signal right out of the back of your PC can go about 50 feet before it starts to deteriorate. A BLACK BOX® Video Splitter can boost that distance to 350 feet or more, depending on your application. However, if you want to extend the distance to your video monitor or control a computer from a distance rather than split the signal to go to multiple monitors, consider one of our Video Extenders on **pages 228–229**.



Black Box offers Video Splitters with up to 12 channels that work with monitors up to 350 feet away from your PC. One is right for your application.

Where Can You Use Black Box Video Splitters?





Presentations.

- Create a video wall for an eye-catching visual for your presentation or seminar.
- Build point-of-sale displays that stop customers in their tracks.
- Demonstrate new software to all the decision-makers at once.
- Display statistics and other information to multiple locations in realtime.
- Create a high-impact sales presentation with prospective buyers each viewing their own monitor.

Classrooms.

- Give personalized training to each student. Learning is faster—retention is greater.
- Make your classes more engaging and more memorable.
- Give students their own display. Eliminate the need to have them crowd around one monitor.
- Control student participation more effectively. Get—and keep—their interest.
- For a complete classroom training system, see **pages 230–231**.

Industry.

- Place monitors on your shop floor, while your CPUs stay in a safe, clean environment.
- Display work orders and other instructions in realtime to multiple stations for more manufacturing efficiency.
- Make sure each worker has the most current information. Eliminate paper-shuffling.
- Set up multiple monitoring stations for automated process control.

Office, Classroom, or Industrial Setting—Black Box Has the *Right* Splitter for You.

RGBS
AC085A
BLACK BOX®
RGBSplit-4
RGBS
RGBS VIDEO SPLITTER
AC063A
S-Video
BLACK BOX®
SVHS Splitter-8
AC043A
CGA/Mono, EGA
BLACK BOX®
4 CHANNEL VIDEO SPLITTER
AC050A

Video Splitters

You've bought the best hardware and software—now get the most out of it. Use Video Splitters to share the information on your screen with others in the office, the classroom, or on the shop floor. There's no reason for people to be looking over your shoulder every time they need information.

Save *stacks* of paper by sharing the information right from your screen. And get great picture quality to boot. Black Box has the right Video Splitter for *every* application. See the comparison chart **below**.

RGBSplit-2, -4 (AC084A, AC085A) — Connect monitors in industrial settings. Both RGBSplits support all sync formats: composite, separate H&V, sync on green, and sync on RGB.

RGBS Video Splitters (AC063A–AC066A) — Multiply your signal for up to 12 auxiliary monitors—perfect for a projection system.

S-Video Splitter (AC043A), Composite Splitter (AC044A) — Get crisp images and ensure appropriate black levels even with a variety of monitors and cable lengths. The S-Video Splitter is for S-VHS, Hi-8, and ED-Beta applications that use 4-pin mini DIN connectors. The Composite Splitter is a composite amplifier with BNC connectors.

CGA/Mono Splitters (AC050A–AC051A), EGA Video Splitter (AC052A) — The quick, easy way to split signals—without tedious configuration! Place a Splitter within 6 feet (1.8 m) of your PC, and cable it from your PC to the monitors.

FAXBACK INFORMATION
For RGBSplit and RGBS Video Splitters: 10092
For 13W3 Video Splitters: 13617
For VGA Video Splitters: 10528
Call 412-746-5500 Anytime

BUYER'S GUIDE

FOR COMPARISON: VIDEO SPLITTERS

Splitter	Video Standards	Number of Channels	Bandwidth	Maximum Distance	Page	Code	Price
RGBSplit-2, -4	RGB, RGBS	2	300 MHz	250 ft. (76.2 m)	**225**	AC084A	**$549.00**
	RGB, RGBS	4	300 MHz	250 ft. (76.2 m)	**225**	AC085A	**$995.00**
RGBS Video Splitter	RGB, RGBS	2	140 MHz	350 ft. (106.7 m)	**225**	AC063A	**$285.00**
	RGB, RGBS	4	140 MHz	350 ft. (106.7 m)	**225**	AC064A	**$575.00**
	RGB, RGBS	8	140 MHz	350 ft. (106.7 m)	**225**	AC065A	**$840.00**
	RGB, RGBS	12	140 MHz	350 ft. (106.7 m)	**225**	AC066A	**$1050.00**
S-Video Splitter	S-Video	8	> 30 MHz	250 ft. (76.2 m)	**225**	AC043A	**$495.00**
Composite Splitter	Composite	8	> 30 MHz	250 ft. (76.2 m)	**225**	AC044A	**$429.00**
CGA/Mono Video Splitter	CGA/Mono	4	15.75 to 21.85 KHz	250 ft. (76.2 m)	**225**	AC050A	**$195.00**
	CGA/Mono	8	18.43 KHz	250 ft. (76.2 m)	**225**	AC051A	**$340.00**
4-Channel EGA Video Splitter	EGA	4	21.85 KHz	100 ft. (30.5 m)	**225**	AC052A	**$340.00**
VGA Video Splitter	Super VGA, VGA, XGA®	2	300 MHz	250 ft. (76.2 m)	**226**	AC056A-R2	**$305.00**
	Super VGA, VGA, XGA	4	300 MHz	250 ft. (76.2 m)	**226**	AC057A-R2	**$510.00**
	Super VGA, VGA, XGA	6	300 MHz	250 ft. (76.2 m)	**226**	AC159A-R2	**$695.00**
	Super VGA, VGA, XGA	8	300 MHz	250 ft. (76.2 m)	**226**	AC058A-R2	**$920.00**
	Super VGA, VGA, XGA	10	300 MHz	250 ft. (76.2 m)	**226**	AC160A-R2	**$1095.00**
13W3 Video Splitter	13W3	2	300 MHz	250 ft. (76.2 m)	**226**	AC088A	**$595.00**
	13W3	4	300 MHz	250 ft. (76.2 m)	**226**	AC089A	**$995.00**
Macintosh Splitter	Mac, up to 1600 x 1280	2	300 MHz	250 ft. (76.2 m)	**226**	AC129A	**$305.00**
	Mac, up to 1600 x 1280	4	300 MHz	250 ft. (76.2 m)	**226**	AC130A	**$510.00**
	Mac, up to 1600 x 1280	4	300 MHz	250 ft. (76.2 m)	**226**	AC131A	**$695.00**
	Mac, up to 1600 x 1280	8	300 MHz	250 ft. (76.2 m)	**226**	AC132A	**$895.00**
	Mac, up to 1600 x 1280	10	300 MHz	250 ft. (76.2 m)	**226**	AC133A	**$1095.00**

remember to order cables

To connect your RGBS Splitters, order our…

RGBS Video Cable, 10-ft. (3.0-m), Male/Male	EYNRGBS2-0010-M	**$64.95**

For other lengths, see p. 93.

To connect your S-Video Splitter, order our…

S-Video Cable

6-ft. (1.8-m)	EHN058-0006	**$15.00**
12-ft. (3.7-m)	EHN058-0012	**$20.00**

To connect your CGA/Mono or EGA Video Splitter, order our…

Video EGA Cable, 10-ft. (3.0-m), PVC, Male/Female	EHM005-0010-MF	**$27.95**

For other lengths, see p. 91.

Extenders
Presentation Tools
CD-ROM

VGA Video Splitters

Connect Multiple Monitors to a Single PC with Our Best-Selling Splitters!

- **Get the distance you need. Send your displays up to 250 feet (76 m) away!**
- **Compatible with VGA, Super VGA, and XGA!**
- **Add ports to connect as many monitors as you want. These Splitters are cascadable.**

Use these Splitters anywhere. Add power to displays, demonstrations, classrooms, even manufacturing facilities. Distribute online information efficiently to workstations on your factory floor while maintaining your CPU in a separate room.

Place monitors up to 250 feet (76.2 m) away with VGA Video Extension Cable. The 300-MHz bandwidth gives you sharp, clear images at any resolution: VGA, Super VGA, or XGA®.

Cascade 2-, 4-, 6-, 8-, or 10-Channel units to transmit to as many monitors as you want. For quick setup, just plug in your monitors and snap a few DIP switches.

To drive VGA signals up to 700 feet (213 m), see our 2-Channel VGA Booster (**page 228**).

PC
Super VGA, VGA, XGA®
BLACK BOX®
VGA Splitter 8-Channel
MADE IN U.S.A.
MONITOR 6
MONITOR 5
MONITOR 4
MONITOR 8
MONITOR 7
MONITOR 3
MONITOR 2
MONITOR 1
VGA IN
POWER
CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!

SPECIFICATIONS

Controls — Monitor Type Selection: 4-position front-panel DIP switch

CE Approval — AC159A-R2, AC058A-R2, AC160A-R2, and 230-VAC versions: AC056AE-R2–AC057AE-R2

Connectors — VGA input and outputs to monitors: HD15S;
Power input: 2.5-mm subminiature phone jack

Indicators — (1) Red LED for power

Power — 2-Channel, 4-Channel: 115 VAC, 60 Hz, using power supply;
6-Channel, 8-Channel, 10-Channel: 100–260 VAC autosensing

Size — 2-Channel: 1.5"H x 7.3"W x 3.3"D (3.8 x 18.4 x 8.3 cm);
All other models: 2.5"H x 7.3"W x 3.3"D (6.4 x 18.4 x 8.3 cm)

Weight — 2-Channel, 4-Channel: 2.5 lb. (1.1 kg);
6-Channel: 3 lb. (1.4 kg);
8-Channel, 10-Channel: 3.5 lb. (1.6 kg)

FAXBACK INFORMATION
Request Document Number: 10528
Call 412-746-5500 Anytime

Item		Code	Price
VGA Video Splitters			
2-Channel	115-VAC	AC056A-R2	**$305.00**
	230-VAC	AC056AE-R2	**$320.00**
4-Channel	115-VAC	AC057A-R2	**$510.00**
	230-VAC	AC057AE-R2	**$520.00**
6-Channel	115-VAC	AC159A-R2	**$695.00**
8-Channel	115-VAC	AC058A-R2	**$920.00**
10-Channel	115-VAC	AC160A-R2	**$1095.00**
VGA Video Splitters Ready Pak Includes the 2-Channel Video Splitter **plus** (**1**) 10-ft. VGA Cable		AC056A-R2-CABPAK	**$339.95**
remember to order cables	VGA Video Extension Cable	EVNPS05	**See page 91.**

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13W3 Video Splitters • Video Splitters for Mac

Get the Power of BLACK BOX® Video Splitters for Your Sun or Mac, Too.

- **300-MHz bandwidth provides sharp, clear images—even up to 1600 x 1200 resolution.**
- **Cascadable—connect as many monitors as you want.**
- **Send displays up to 250 ft. (76 m) away!**

Now there's a Splitter for your Mac® or Sun® computer, for almost any application, *anywhere.*

Use a Video Splitter in the classroom. Link your CPU to up to 10 student monitors—and eliminate the huddle around your computer!

Or create eye-catching presentations for your next sales pitch. You can demonstrate new software to everyone in the meeting at once, or display statistics or other important information to other locations in realtime.

Or use them in an industrial setting to protect your CPU. Place monitors on the shop floor and your CPUs in a place where they won't get damaged. You can make sure each worker has the most current information.

For optimum operation, be sure all monitors support the same resolution when they're connected to the Splitter.

Sun®
13W3
BLACK BOX®
(412) 746-5500
13W3 SPLITTER
2-CHANNEL
MONITOR TYPE
POWER
Mac®
BLACK BOX®
(412) 746-5500
Video Splitter for Mac®
MONITOR TYPE
POWER

SPECIFICATIONS

Bandwidth — 300 MHz

Controls — Monitor Type Selection: 4-position front-panel DIP switch

CE Approval — AC131A–AC133A and 230-VAC versions: AC129AE–AC130AE

Connectors — AC088A–AC089A: 13W3 female;
AC129–AC133: Mac input and outputs to monitors: DB15

Indicators — (1) Red LED for power

Power — AC088A–AC089A, AC129A–AC130A: 115-VAC wall plug in;
AC129AE–AC130AE: 220–240-VAC tabletop;
AC131A–AC133A: 95–250-VAC universal input tabletop supply

Size — AC088A: 2.5"H x 5.5"W x 3.5"D (6.4 x 14 x 8.9);
AC089A: 2.5"H x 7.3"W x 3.5"D (6.4 x 18.5 x 8.9);
AC129A, AC129AE: 1.5"H x 7.3"Wx 3.3"D (3.8 x 18.5 x 8.4 cm);
AC130A–AC133A: 2.5"H x 7.3"W x 3.3"D (6.4 x 18.5 x 8.4 cm)

Weight — AC088A–AC089A: 0.9 lb. (0.4 kg);
AC129A: 0.7 lb. (0.3 kg);
AC130A–AC133A: 1.5 lb. (0.7 kg)

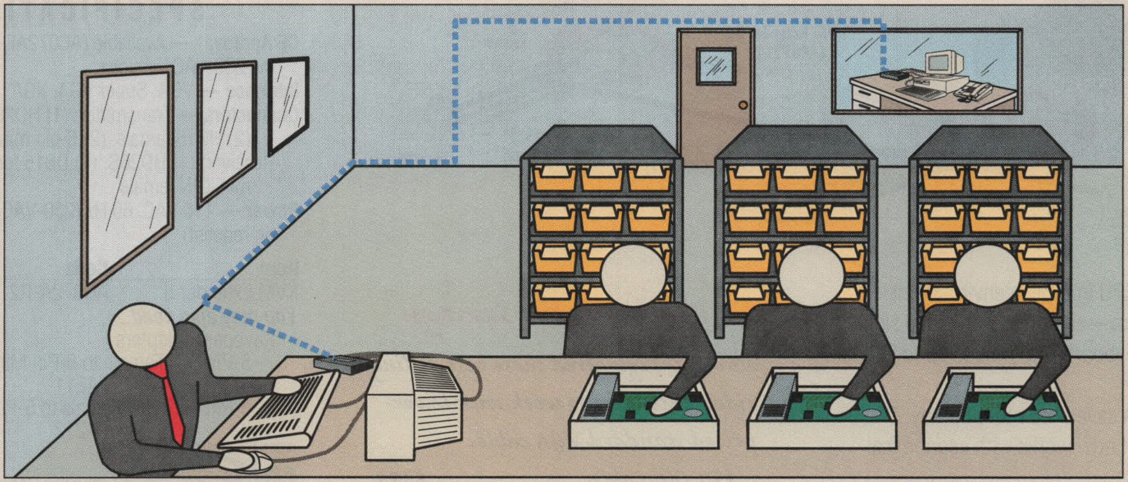
FAXBACK INFORMATION
For 13W3 Video Splitters: 13617,
For Video Splitters for Mac: 17020,
Call 412-746-5500 Anytime

NOTE: 13W3 Video Splitters are compatible with Sun, NeXT, Silicon Graphics Apollo, and HP.

Item		Code	Price
13W3 Video Splitters (for Sun®, NeXT®, Silicon Graphics Apollo®, HP®)			
2-Channel	115-VAC	AC088A	**$595.00**
4-Channel	115-VAC	AC089A	**$995.00**
Video Splitters for Mac			
2-Channel	115-VAC	AC129A	**$305.00**
	230-VAC	AC129AE	**$305.00**
4-Channel	115-VAC	AC130A	**$510.00**
	230-VAC	AC130AE	**$510.00**
6-Channel	115-VAC	AC131A	**$695.00**
8-Channel	115-VAC	AC132A	**$895.00**
10-Channel	115-VAC	AC133A	**$1095.00**
remember to order cables	S-Video Cable		
	6-ft. (1.8-m)	EHN058-0006	**$15.00**
	12-ft. (3.7-m)	EHN058-0012	**$20.00**

Put Some Distance between Your CPU and Monitor.

Move your video monitor up to 700 feet away from your CPU! A Video Extender reamplifies your video signal, so you can extend the distance between a CPU and a video monitor *without* degradation of the video image. For instance, our KVM Extender II and 2-Channel VGA Booster support 1024 x 768 resolution to 500 feet and 640 x 480 resolution to 700 feet, respectively. And they do this with absolutely *no* loss of video quality.



Keep your CPU away from the manufacturing floor, safe from dirt, vibration, and accidental damage.

BUYER'S GUIDE

EXTENDERS/SHARERS						
Extender/Sharer	**Code**	**Maximum Distance**	**Supports**	**Keyboard Supported**	**Max. Resolution**	**Page**
Station Extenders for Mac or Sun	AC267A, AC277A	200 ft. (61 m)	Monitor, Keyboard, Mouse	Macintosh or Sun	1024 x 768	**227**
KVM Extender II (for VGA)	AC072A	700 ft. (213 m)	Monitor, Keyboard, Mouse	6-pin mini DIN	1024 x 768	**228**
2-Channel VGA Booster	AC074A	700 ft. (213 m)	Monitor		1024 x 768	**228**
KVM Extender/Sharer (for VGA)	AC230A–AC235A	150 ft. (45.7 m)	Monitor, Keyboard, Mouse	5-pin DIN	1024 x 768	**229**

Station Extenders for Mac or Sun

Move Your Mac or Sun Keyboard, Monitor, and Mouse up to 200 Feet Away from Your CPU!

- **Move your CPU to a safe environment.**
- **Totally transparent to your applications.**
- **Easy to install.**

Station Extenders are simple and inexpensive video extenders for your Mac® or Sun® computer. They use proven ServSwitch™ technology to enable you to move your Keyboard/Video/Mouse up to 200 feet away from your CPU.

Setup is easy. Just connect the Extenders to your system and then to each other with a Station Extender Cable. After Station Extenders are installed, they work transparently—you never have to pay attention to them again. A yellow LED on the side of the unit lights when the Station Extender is receiving power.

What's in the Kit:

- (2) Station Extenders
- Keyboard/Video/Mouse-to-Station Extender Cable
- CPU-to-Station Extender Cable
- Power Supply

SPECIFICATIONS

Connectors — DB25M
Indicators — (1) Yellow LED
Power — From power supply or interface
Size — 0.6"H x 2.1"W x 2.5"D (1.5 x 5.3 x 6.4 cm)
Weight — AC267A: 3 lb. (1.4 kg);
AC277A: 1 lb. (0.5 kg)

FAXBACK INFORMATION
Request Document Number: 17288
Call 412-746-5500 Anytime

Item	Code	Price
Station Extender for Mac CPU to Keyboard/Video/Mouse	AC267A	**$495.00**
Station Extender for Sun CPU to Keyboard/Video/Mouse	AC277A	**$495.00**
remember to order cables Station Extender Cable		
50-ft. (15.2-m)	EHN250-0050	**$205.00**
100-ft. (30.4-m)	EHN250-0100	**$330.00**
150-ft. (45.7-m)	EHN250-0150	**$455.00**
200-ft. (60.9-m)	EHN250-0200	**$580.00**

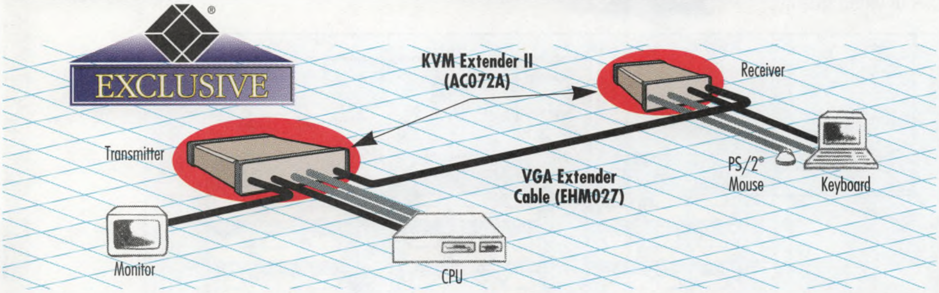
Keyboard/Video Monitor/Mouse Extender II (for VGA)

Put Your Monitor, Keyboard, and Mouse up to *700 Feet Away* from Your CPU.

- **Supports a local keyboard, monitor, and mouse without a manual switch.**
- **Save money with our new simplified cabling system.**
- **"Constant keyboard" feature sends continuous keyboard signals to your PC.**
- **Now get even sharper images.**

BLACK BOX (412) 746-5500
PWR
REMOTE
LOCAL
INCREASE
COMPENSATION
S1
KVM Extender III Transmitter

VGA, Super VGA, or XGA®


EXCLUSIVE
KVM Extender II (AC072A)
Receiver
Transmitter
PS/2® Mouse
Keyboard
VGA Extender Cable (EHM027)
Monitor
CPU

Keep your CPU in a clean environment like a computer room—and drive your video signals to a monitor, keyboard, and mouse up to 700 feet (213.4 m) away.

And you can save even more money: The KVM Extender II now works with economical VGA cabling!

Check Out the Savings!

We've re-engineered these best-selling Video Extenders to work with lower-priced standard VGA cable.

150' Old Cable:........................ $389

150' New Cable:....................... $242

Save 37% on cable NOW!

FAXBACK INFORMATION
Request Document Number: 11237
Call 412-746-5500 Anytime

SPECIFICATIONS

CE Approval — Available (AC072AE-R2, the 230-VAC version)

Interface — VGA, Super VGA, XGA®

Connectors — Transmitter: (1) HD26S, (2) HD15 female, (2) 6-pin mini DIN female; Receiver: (1) HD26S, (1) DB15 female, (2) 6-pin mini DIN female

Power — 115 VAC, 60 Hz (230-VAC, 50-Hz version on request)

Item	Code	Price
KVM Extender II	AC072A-R2	**$795.00**
You may also need...		
Keyboard Adapters		
5-Pin DIN Female to 6-Pin Mini DIN Male	FA211	**$5.95**
6-Pin Mini DIN Female to 5-Pin DIN Male	FA212	**$5.95**
remember to order **cables** VGA Extender Cable		
50-ft. (15.2-m)	EHM027-0050	**$96.90**
75-ft. (22.9-m)	EHM027-0075	**$133.50**
100-ft. (30.5-m)	EHM027-0100	**$170.05**
150-ft. (45.1-m)	EHM027-0150	**$242.20**

For longer cable lengths, call Technical Support.

For Sun or Macintosh Extenders, see our Station Extenders on p. 227.

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2-Channel VGA Booster

Picture This: Great Video at Great Distances.

- **Clear video signals at up to 700 feet.**
- **Display on two remote monitors—simultaneously.**
- **Protect your CPU with distance by securing it out of view.**
- **Save money with our new simplified cabling system.**

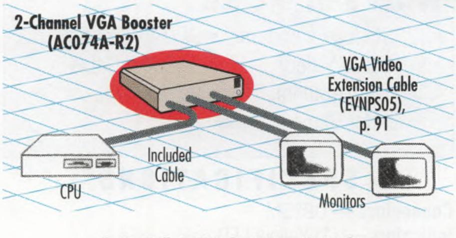
VGA, Super VGA, or XGA®, Video Only

EXCLUSIVE
SHORT
LONG
OUTPUT 1
BLACK BOX (412) 746-5500
VGA Booster II
SHORT
LONG
OUTPUT 2

Put your color or monochrome monitors where you want them while you protect your PC from noisy and dirty work environments that can cripple your system. New technology reduces the number of connector wires required so you save more money by using less-expensive cable.

Send VGA signals 700 feet (213 m). At 800 x 600 resolution, the Booster extends XGA® and Super VGA 600 feet (183 m). At 1024 x 768 resolution, your signal limit is 500 feet (152.4 m). And you get crisp, clear images. Sharpness-preserving circuitry is controlled by a special rotary switch that selects distances.

A 6-foot (1.8-m) DB15HD male-to-male input cable is included.


2-Channel VGA Booster (AC074A-R2)
VGA Video Extension Cable (EVNPS05), p. 91
Included Cable
CPU
Monitors

SPECIFICATIONS

CE Approval — Available (AC074AE-R2, the 230-VAC version)

Interface — VGA, Super VGA, XGA

Connectors — (3) HD15 (female)

Power — 115 VAC, 60 Hz (230-VAC, 50-Hz version on request)

Size — 1.5"H x 7.3"W x 6.3"D (3.8 x 18.5 x 16 cm)

Weight — 1.5 lb. (0.7 kg)

FAXBACK INFORMATION
Request Document Number: 11244
Call 412-746-5500 Anytime

Item	Code	Price
2-Channel VGA Booster	AC074A-R2	**$549.00**
remember to order **cables** VGA Video Extension Cable (Male/Female)		
50-ft. (15.2-m)	EVNPS05-0050-MF	**$99.95**
75-ft. (22.9-m)	EVNPS05-0075-MF	**$124.95**
100-ft. (30.5-m)	EVNPS05-0100-MF	**$149.95**

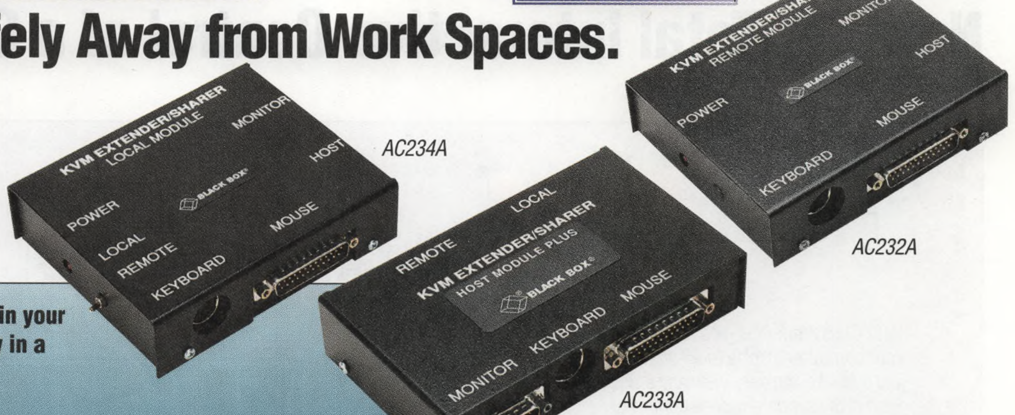
For longer cable lengths, see p. 91.

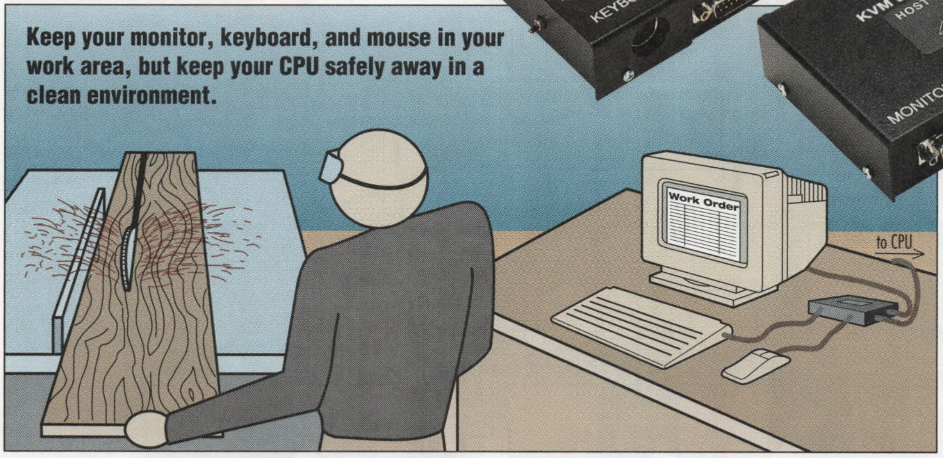
EXCLUSIVE

Keyboard/Video Monitor/Mouse Extender/Sharer (for VGA)

Keep Your CPUs Safely Away from Work Spaces.

- **Keep your CPU up to 150 feet away from your keyboard, monitor, and mouse.**
- **Remote workstation ends your CPU security problem.**
- **Optional Shared Mode so you can work at either workstation.**


KVM EXTENDER/SHARER
LOCAL MODULE
POWER
LOCAL
REMOTE
KEYBOARD
MOUSE
HOST
MONITOR
BLACK BOX
AC234A
KVM EXTENDER/SHARER
HOST MODULE PLUS
REMOTE
LOCAL
MONITOR
KEYBOARD
MOUSE
AC233A
KVM EXTENDER/SHARER
REMOTE MODULE
POWER
KEYBOARD
MOUSE
HOST
MONITOR
AC232A


Keep your monitor, keyboard, and mouse in your work area, but keep your CPU safely away in a clean environment.
Work Order
to CPU

VGA, Super VGA, or XGA®

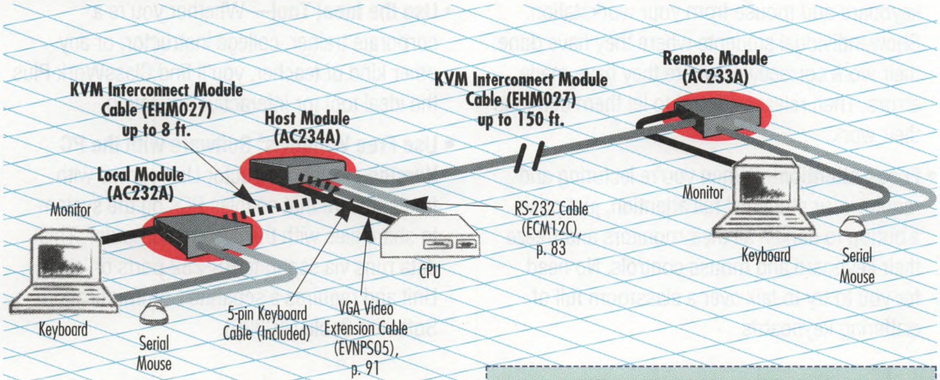
The hard drive on your CPU can be your business's most valuable asset, containing all your working information. But it can also be your business's most vulnerable asset—at the mercy of dirt, moisture, vibrations, strong electromagnetic fields, and even theft.

The solution is to keep your CPU in a secure, controlled environment—and install the monitor, keyboard, and Microsoft® serial mouse (or compatible) where your users will be. All it takes is a KVM Extender/Sharer from Black Box.

If you need workstations on the shop floor, install them without worry. Your CPUs can be kept out of that industrial environment—up to 150 feet (45.7 m) away. If you're concerned about access to your CPUs, install them in secure locations. The workstations stay where your users are.

You can connect up to two workstations—one local, one remote—to one CPU, for three operation modes. In Local mode, the local monitor, keyboard, and mouse control are active. In Remote, the remote monitor, keyboard, and mouse are active. In Shared Mode, both monitors are active and you can switch keyboard/mouse control from one to the other. The BLACK BOX® Host Module Plus gives you simultaneous video and keyboard control, so anyone at either monitor can use the system.

To locate another monitor, keyboard, and mouse next to the CPU, you will need Local Module (AC232A) and an additional EHM027 cable. If you have an AT® style mouse (with DB9 connector), call Tech Support for a special adapter.


KVM Interconnect Module Cable (EHM027) up to 8 ft.
Host Module (AC234A)
Local Module (AC232A)
Monitor
Keyboard
Serial Mouse
5-pin Keyboard Cable (Included)
VGA Video Extension Cable (EVNPS05), p. 91
CPU
RS-232 Cable (ECM12C), p. 83
KVM Interconnect Module Cable (EHM027) up to 150 ft.
Remote Module (AC233A)
Monitor
Keyboard
Serial Mouse

FAXBACK INFORMATION
Request Document Number: 10023
Call 412-746-5500 Anytime

SPECIFICATIONS

Resolution — 1024 x 768 at 100 ft. (30.5 m); 800 x 600 at 150 ft. (45.7 m)
Switches — Local-Remote selector on local unit
CE Approval — All items listed are approved
Connectors — AC231A: DB15 male;
AC234A: DB15 male;
AC232A–AC233A: 5-pin DIN for keyboard, DB25 male for serial RS-232 mouse, DB15HD female for VGA only, DB15 male for interconnect port
Indicators — Power LED (red)
Power — 5 VDC, from keyboard port of CPU

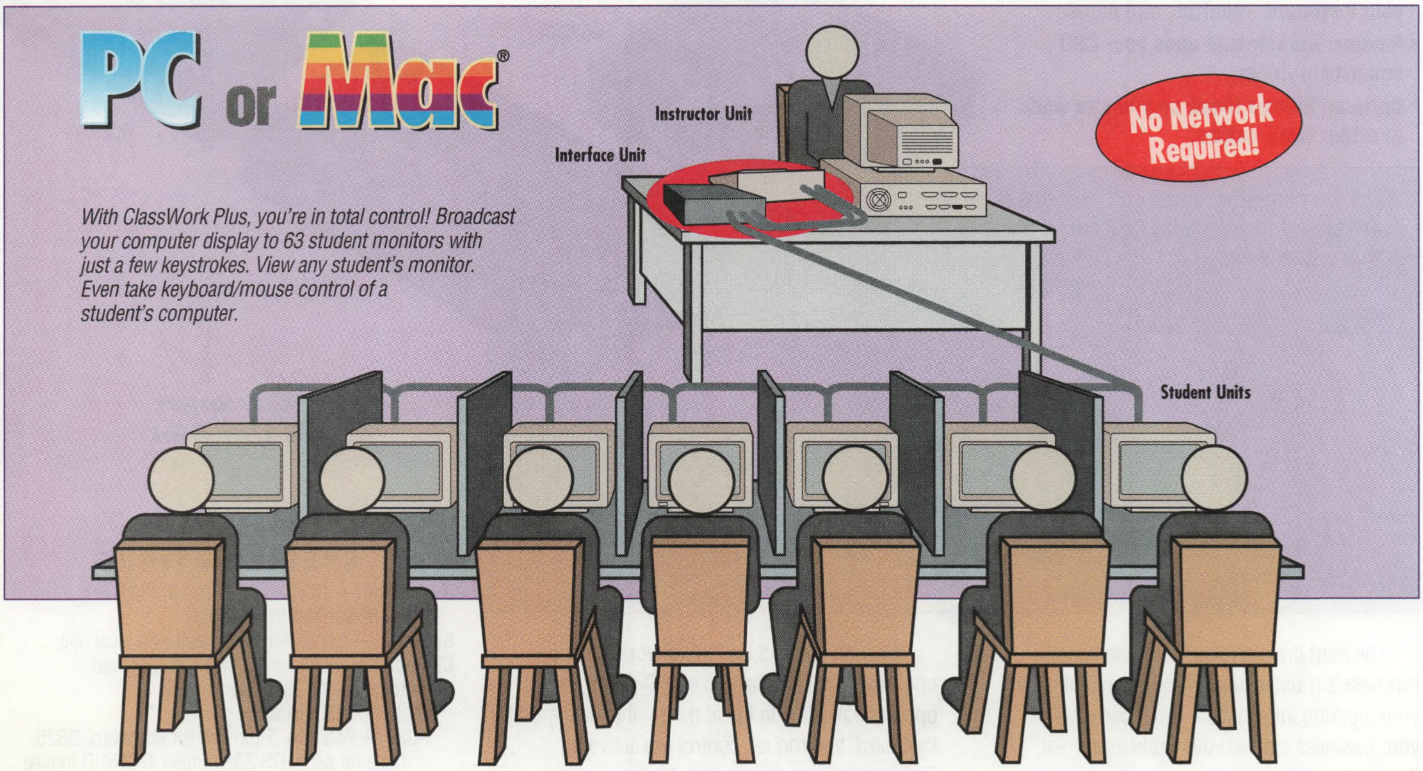
Item	Code	Price
KVM Extender/Sharer (for VGA)		
Host Module (Includes Keyboard Cable)	AC231A	**$250.00**
Host Module Plus (Includes Keyboard Cable)	AC234A	**$420.00**
Local Module	AC232A	**$164.00**
Remote Module	AC233A	**$128.00**
All Three Modules (Host, Local, and Remote)	AC230A	**$515.00**
All Three Modules Plus (Host Plus, Local, and Remote)	AC235A	**$690.00**
KVM Interconnect Module Cable		
6-ft. (1.8-m)	EHM027-0006	**$33.40**
10-ft. (3.0-m)	EHM027-0010	**$38.75**
25-ft. (7.6-m)	EHM027-0025	**$60.30**
50-ft. (15.2-m)	EHM027-0050	**$96.90**
75-ft. (22.9-m)	EHM027-0075	**$133.50**
100-ft. (30.5-m)	EHM027-0100	**$170.05**
150-ft. (45.7-m)	EHM027-0150	**$242.20**
Custom lengths	EHM027	**$26.95 + $1.62/ft.**
You may also need:		
Keyboard Adapters		
5-Pin DIN Female to 6-Pin Mini DIN Male	FA211	**$5.95**
6-Pin Mini DIN Female to 5-Pin DIN Male	FA212	**$5.95**
RS-232 Cable		**See p. 83.**
VGA Video Extension Cable		**See p. 91.**

remember to order cables

See our full line of Keyboard, Video, & Mouse Cables on pp. 90–93.

ClassWork Plus Interactive Display Systems

Now Get Total Interactive Control of a Computer Room—



With ClassWork Plus, you're in total control! Broadcast your computer display to 63 student monitors with just a few keystrokes. View any student's monitor. Even take keyboard/mouse control of a student's computer.

- **Broadcast the display from your instructor's monitor to up to 63 daisychained student computers.**
- **Completely independent of network software!**
- **Observe individual student screens from your own monitor.**

With the ClassWork Plus, you can set up a computer room for in-house training that gives you *total* pushbutton control over a roomful of students' computers. Black Box offers both PC and Mac® versions.

The ClassWork Plus is easy to install and easy to use. It's totally transparent to hardware, operating systems, and network protocols. Use it to interconnect standalone computers, or multiple workstations linked via a local area network.

How does it work?

Both versions of the ClassWork Plus training system require one Instructor Unit Kit, plus one Student Unit Kit for each computer in the classroom.

Using the Instructor Unit, with its four-line LCD command window and 26-key pushbutton controls, you can:

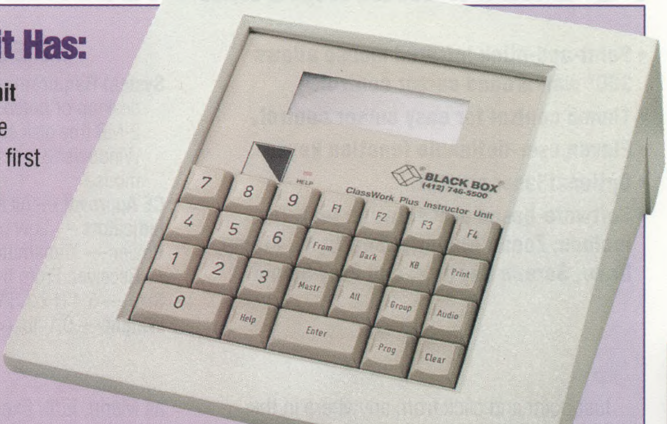
- **Demonstrate**—Project your computer screen to any student's monitor. For group projects and student presentations, send any student's screen to another computer, to a select group of computers, or to the entire class!
- **Selectively Observe**—Call up individual student screens on your monitor. Watch their progress as they learn by doing. Use the adjustable automatic timer to scan all student monitors sequentially.
- **Interact**—Control any student's computer keyboard and mouse from your workstation. Show individual students where they have done their work correctly or where they have made errors. Then release control to let them continue their work.
- **Focus Attention**—When you're lecturing and require your students' full attention, just push a button to darken all their monitors and freeze their keyboard and mouse controls. No need for you to try to talk over a classroom full of clattering keyboards.
- **Assist Individual Students**—Your class members can call you when they need extra guidance, just by using the bidirectional Help button on each Student Unit. An LED on the Instructor Unit lights to show which student is requesting help (stores up to six help requests).
- **Increase Classroom Efficiency**—You and your students don't need floppy disks to transfer files from computer to computer. What would otherwise be a clumsy and time-consuming process is now quick and easy.
- **Use the Ideal Tool**—Whether you're a corporate trainer, college instructor, or any other kind of teacher, you'll find ClassWork Plus the ideal tool for interactive education.
- **Use Free Windows® Software with the PC Version**—Each Instructor Unit comes with free software that enables PCs on the system to share files with the system computer. This data runs via separate RS-232 ports on each Unit and requires a separate Communication Software Cable (AC826).

up to 63 Students—at the Touch of a Button!

> ***"I teach a course for first-graders who are learning how to use a computer for the first time. As you may guess, some of my students need extra guidance to go with their enthusiasm. Thanks to ClassWork Plus, I have the interactive control I need to teach a roomful of 25 very eager students!"***

Each Instructor Kit Has:

- **(1) Keypad/LCD Control Unit**
- **(1) Interface Unit**—links the instructor's computer to the first Student Unit in a daisychain
- **(1) Power Supply**
- **(2) Software Disks (Windows®)**—(PC only)
- **(1) VGA Screen Cable**—links a video out to the Instructor Interface Unit
- **(2) Network Terminators**
- **(1) Keyboard/Mouse Cable**—(Mac® only)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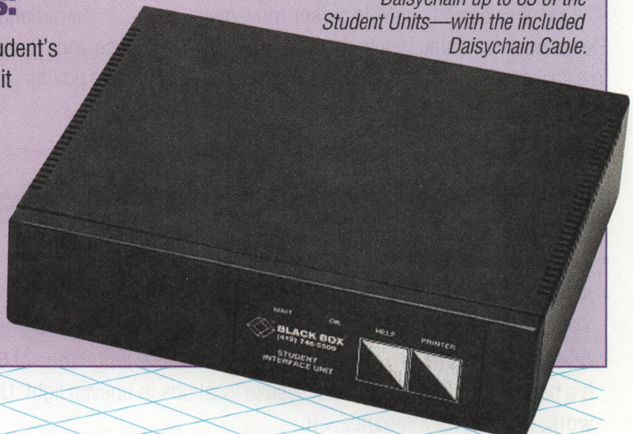
HELP
BLACK BOX
(412) 746-5500
ClassWork Plus Instructor Unit

The Instructor Unit's pushbuttons and LCD display make it easy to interact with students.

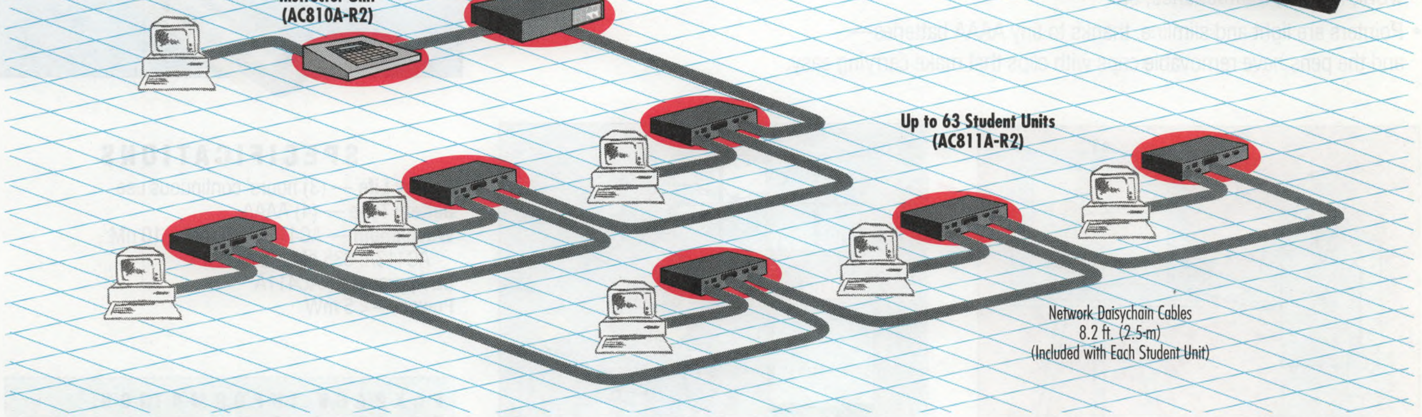
Each Student Kit Has:

- **(1) Interface Unit**—links one student's computer to the next Student Unit in a daisychain
- **(1) Power Supply**
- **(1) VGA Screen Cable**—links a student computer video out to the Student Unit
- **(1) Network Daisychain Cable**—links to the next Interface Unit in a system

Daisychain up to 63 of the Student Units—with the included Daisychain Cable.


WAIT
OK
HELP
PRINTER
BLACK BOX
(412) 746-5500
STUDENT INTERFACE UNIT

FAXBACK INFORMATION
Request Document Number: 13019
Call 412-746-5500 Anytime


Interface Unit
Instructor Unit
(AC810A-R2)
Up to 63 Student Units
(AC811A-R2)
Network Daisychain Cables
8.2 ft. (2.5 m)
(Included with Each Student Unit)

SPECIFICATIONS

Maximum Number of Student PCs — 63
Resolution — Up to 1280 x 1024
CE Approval — 230-VAC versions: AC810AE-R2–AC811AE-R2, AC830AE–AC831AE
Connectors — Instructor Interface and Student Units: (2) DB25 female system ports, (1) DB15HD male screen-in, (1) DB15HD female screen-out, (1) DB9 female keyboard in/out, (1) DB9 male mouse in/out, (1) stereo jack (comm port); Instructor Interface Unit also has (1) 5-pin DIN Instructor Control Unit port
Power — Input: 115 VAC; Output: 9 VAC, 1500 mA (230-VAC version on request)
Size — Instructor Control Unit: 3.6"H x 8.6"W x 9"D (9.1 x 21.8 x 22.9 cm); Instructor Interface: 2"H x 8.9"W x 6.5"D (5.1 x 22.6 x 16.5 cm); Student Unit: 2"H x 7.7"W x 6.5"D (5.1 x 19.6 x 16.5 cm)

Item	Code	Price
ClassWork Plus for PC		
Instructor Unit Kit	AC810A-R2	**$1894.00**
Student Unit Kit	AC811A-R2	**$384.00**
ClassWork Plus for Mac		
Instructor Unit Kit	AC830A	**$1950.00**
Student Unit Kit	AC831A	**$440.00**

Remote Mouse • Remote Mouse with Laser

The Tool that Puts You in Control of PC-Based Multimedia Presentations.

- **Point-and-click infrared mouse allows 360° walkaround cursor control.**
- **Thumb control for easy cursor control.**
- **Eleven user-definable function keys.**
- **Optional laser pointer.**
- **Software-based presentation features include: Zoom, Magnify, Spotlight, Stamp, Draw, Screen Capture, and Play Sound.**

SPECIFICATIONS

System Requirements — IBM® PC compatible desktop or notebook computer, 286 or faster; 2-MB free disk space, floppy disk drive; 4-MB RAM; Windows® 3.1 or Windows 95, Serial port; standard mouse

CE Approval — All items listed are approved

Indicators — Low battery

Power — Transmitter: (2) AAA batteries; Receiver: From the interface

Size — 5.4"H x 1.8"W x 1.3"D (13.6 x 4.5 x 3.3 cm)

Weight — 0.1 lb. (< 0.1 kg) without batteries

Just point and click from anywhere in the room, up to 33 feet (10 m) away from your PC. This Mouse fits easily in your hand and has the control and LEDs for total remote operation of any PC-style computer.

One easy button controls cursor movement. Eleven user-definable function keys enable you to easily program in and execute functions such as Menu, Edit, Execute Program, and Hot Key.

The Remote Mouse is totally compatible with Windows 3.1 and Windows 95. Software (3½" disk) includes video features like Zoom, Draw, and Center Cursor.

An optional red-dot laser enables you to use your Remote-Control Mouse with Laser as a pointer.

New
BLACK BOX
Remote Mouse with Laser

Just turn the Remote Mouse with Laser around and it's a Laser Pointer!

FAXBACK INFORMATION
Request Document Number: 12795
Call 412-746-5500 Anytime

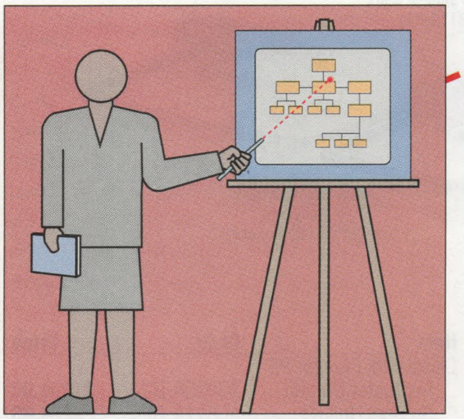
Item	Code	Price
Remote Mouse	AC485A	**$179.00**
Remote Mouse with Laser	AC480A-R2	**$239.00**

◆ ◆ ◆

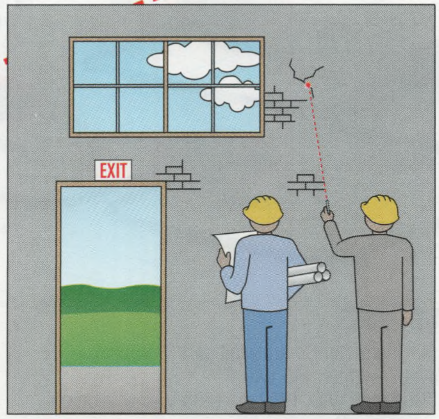
Laser Pointers

Laser-Beam Precision Gets Attention!

- Choose a pointer with either a red or orange beam.
- AC411A's red-dot pointer has a range of 300 ft. (100 m). You get freedom of movement in auditoriums or conference rooms!
- AC413A's powerful 5-mW orange-dot pointer has a long range of 600 ft. (200 m)! It's perfect for highlighting inaccessible locations in uneven light. Use it for contract work, repairs, maintenance, etc.
- Pointers are light and slimline, thanks to tiny AAAA batteries—and the pens have removable caps with clips that make carrying easy.



Use the AC411A for presentations, lectures, or training—and have the freedom to move around the conference room or large hall.



Use the AC413A's powerful 5-mW pointer to highlight inaccessible locations in uneven light. It's perfect for contract work, repairs, maintenance—and more!

SPECIFICATIONS

Battery Life — (3) hours' continuous use

Battery Type — (4) AAAA

Wavelength — AC411A: 670 nM ± 10 nM; AC413A: 635 nM ± 5 nM

CE Approval — AC411A

Power — < 5 mW

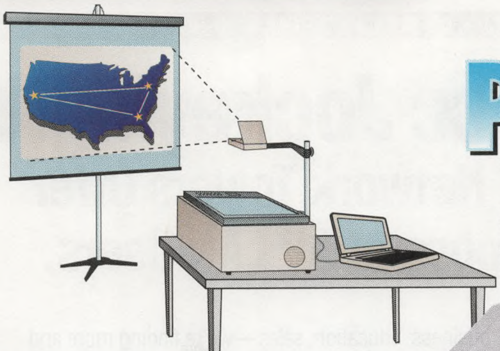
FAXBACK INFORMATION
Request Document Number: 16627
Call 412-746-5500 Anytime

Item	Code	Price
Laser Pointers		
Red Beam	AC411A	**$149.00**
Orange Beam	AC413A	**$219.00**

True-Color LCD Panel

Make Dazzling Overhead Multimedia Displays.

Mac and PC Graphics and Full-Motion Video—up to 16.7 Million Colors!



PC and Mac®

Place the True-Color LCD Panel atop an overhead projector and your presentations have 16.7 million more convincing reasons.

BLACK BOX
16.7M True Color LCD Panel
BLACK BOX

- **Active-matrix technology brings out the most vibrant hues!**
- **Compact, lightweight, rugged. Perfect for portable presentations with laptop computers.**
- **Displays PC graphics *and* full-motion video.**
- **Its 100:1 contrast ratio provides the brightest possible pictures.**
- **Compatible with Macintosh® and VGA systems.**
- **Y cable enables the Panel and your laptop's monitor to stay on simultaneously.**

SPECIFICATIONS

Approvals — UL®, CSA
Contrast — 100: 1
LCD Matrix — Active
Maximum Colors — 16.7 million
Resolution — 640 x 480
Response Time — 30 ms
Power — 100 to 250 VAC, 60–50 Hz, autosensing
Size — 1.9"H x 12.5"W x 13.6"D (4.8 x 31.8 x 34.5 cm)
Weight — 4.8 lb. (2.2 kg)

Simply plug the True-Color LCD Panel into your laptop, then lay the Panel atop an overhead projector. That's all it takes to transfer vivid color images from your computer to the big screen. That's state-of-the-art 24-bit technology!

Your Panel is smart, too. It automatically adjusts to the number of colors required by each software program—so you avoid having to perform lengthy, embarrassing, and unprofessional corrections in front of an audience.

The True-Color LCD Panel comes with a 100- to 250-VAC autosensing power supply for compatibility with AC sources worldwide.

FAXBACK INFORMATION
Request Document Number: 16139
Call 412-746-5500 Anytime

Item	Code	Price
True-Color LCD Panel	AC404A	**$3695.00**
Soft-Side Carry Case	AC405A	**$154.00**

◆ ◆ ◆

Keyboard Emulator

BLACK BOX
(412) 746-5500
PC
KBD
Keyboard Emulator

Boot Up without a Keyboard. Don't Risk Your PC Security.

- **Protect server and demonstration PC systems from unauthorized users.**
- **Small, easy to install.**
- **Needs no external power supply.**

If you need to have occasional keyboard access, choose the Keyboard Emulator Plus. An additional connector lets you attach a keyboard without disconnecting the Plus or turning off your PC. Both models support scan modes 1, 2, and 3, and they include a 6-foot (1.8-m) cable.

FAXBACK INFORMATION
Request Document Number: 14333
Call 412-746-5500 Anytime

SPECIFICATIONS

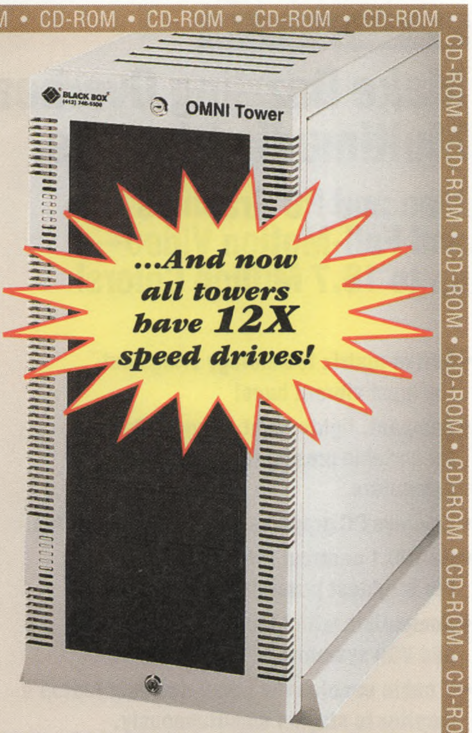
System Requirements — PC AT®, PS/2®, or compatible
CE Approval — All items listed are approved
Connectors — Both models: (1) 6-pin round mini DIN male;
AC243A: (1) 6-pin round mini DIN female
Power — From PC, + 4.75 to 5.25 VDC, 100 mA
Size — 2.2"H x 3.3"W x 1.2"D (5.6 x 8.4 x 3 cm)
Weight — 0.3 lb. (0.1 kg)

Item	Code	Price
Keyboard Emulator	AC242A	**$60.00**
Keyboard Emulator Plus	AC243A	**$76.00**

> ***"Your section introductions are great! They show what the products do and how they work. Thanks for making your Catalog so user-friendly and easy to understand."***
>
> J. Richard Burke, Ph.D., President
> J. Richard Burke, Inc.

No More Disc Jockeying...

One-Tap CD-ROM Network Towers Offer Simultaneous Access to All LAN Users.



No matter what field—law, medicine, business, education, sales—we're finding more and more ways to take advantage of the incredible storage capacities of CD-ROM for storing customer records, multimedia presentations, or other resources. And now all our towers have 12X speed drives! No matter how large your installation—workgroup or LAN—Black Box has the tower for you!

Unlike standalone drives, CD Towers give your whole workgroup all the access it needs, and they're faster than single-mechanism jukebox drives. They easily accomodate multidisc applications on multiple copies of CD-ROM discs because Network CD Tower users can access the same disc simultaneously—another advantage they have over single drives inside PCs. Also, network administrators can control access to the CDs and ensure that sensitive material is protected. Get to work faster and get the security you need.

BLACK BOX® CD Towers are *the* choice when your business depends on speedy access to its CD-based software.

Black Box Explains...

Multi-Disc, Multi-Drive Applications.

Once, the capacity of CD-ROM discs seemed to be nearly infinite. But now, despite the huge capacity of CD-ROM, many databases and applications, such as Microsoft® Encarta®, take up multiple discs.

Jukebox-style CD-ROM systems read discs one at a time with a single laser read head and drive mechanism. This causes annoying delays while each disc is slowly loaded and unloaded as it's requested. And though jukeboxes can hold multiple CDs, only one user at a time can access the system.

With separate read heads, all discs in BLACK BOX® CD-ROM Towers are constantly loaded—*ready for use.* This eliminates the wait while loading one disc after another.

Judging CD-ROM Drive Speed.

While it's common to state the speed of a CD-ROM drive in terms of its X-speed rating, this measure is only one indicator of actual performance in your applications.

The performance of a CD-ROM drive is also affected by its interface to your computer—especially in multi-user applications. The two standard drive interfaces are IDE and SCSI.

IDE is a passive, low-cost solution intended for single drives attached to standalone PCs. Because it's simple, it relies on the CPU and system resources of its host PC to operate. The slowdown created by this interface isn't too noticeable when using a single drive, but when multiple drives are connected, the drives spend so much time handshaking with the host CPU that they cause dips and surges in performance—especially in processor-intensive multimedia applications such as software-decompressed video and 3-D rendering.

Because a SCSI interface actively manages all connected devices, it rarely commands more than 10% of a system's resources, enabling multiple drives to work together efficiently to yield higher aggregate throughput. For group applications, such as linking CD drives to a LAN, a SCSI-compatible drive is clearly the best choice.

BUYER'S GUIDE

CD-ROM TOWERS

CD-ROM Tower	Description
SCSI CD Tower	Fast access to up to seven CD-ROMs for your workgroup. LAN-adaptable for future expansion.
T7 Plus CD Network Towers	Seven easy CD-ROM drives—the plug-and-play, network-ready Tower for Ethernet or Token Ring.
OMNI Towers	The powerful, modular Tower that expands to meet your needs. All key components pop out for easy upgrades.

T7 Plus CD Network Tower (for Novell or Windows NT)

Plug Directly into a Novell or Windows NT Network.

- **Now with 12X speed drives!**
- **100% network-ready with Plug-and-Play connections for Ethernet or Token Ring.**
- **Provides transparent CD-ROM access for Novell® NetWare® or Windows NT™ operating systems.**
- **One Tower holds seven SCSI-2 drives for multiple access by multiple users—*simultaneously!***
- **Drives appear as volumes on the server. Drag-and-drop software makes data access easy.**
- **Lock-tight security door keeps drives safe and dust-free for peak operating efficiency.**

Forget Jukeboxes and Standalone Drives— Now multiple *network* users can share the same CD drives *and* access multiple compact discs simultaneously with just one network tap! T7 Plus CD Network Towers make it possible. With just a single network interface, they're the easiest, *most efficient* way to add CD-ROM technology to your network. And *everything's* built in—including premium quad-speed drives and either an Ethernet or a Token Ring LAN Access Unit.

Install the Tower *anywhere* on your 10BASE-T, Thin Ethernet, or Token Ring LAN—just like adding a new node. No extra SCSI cards, TSRs, or dedicated file servers are needed. Even the network cables and DiscView® software for drag-and-drop operation are included! Use with Novell® networked PCs *or* Mac® computers (on networks running the Novell Mac NLM). Or choose our Towers to add CD-ROM to your Windows NT network.

Each Tower houses seven CD-ROM drives behind a lockable security door. The caddyless drives help simplify the network manager's tasks. Just pop in any disc to provide instant access for your entire network. Search references, public-domain files, even archives you record yourself (check out the CD-Recordable Discs on **page 237**). With CD support from Black Box, you always run at top speed—no matter what your operating system. It's another reason why we're *The World's Source for Connectivity*℠.

Plug and Play for Novell® and Windows NT™ Networks—with 12X Speed!

FAXBACK INFORMATION
CD Network Tower for Novell NetWare: 12757,
CD Network Tower for Windows NT: 15729
Call 412-746-5500 Anytime

BLACK BOX
T7 Plus Ethernet
CD Network Tower

T7 Plus CD-ROM Towers have built-in network access units which provide a direct link to Ethernet or Token Ring. Plug in a Tower just like a network node. You've instantly added seven quad-speed drives to your network.

Add 7 CD-ROM Drives to Your Network—Easily. Just Plug and Play!

Plug in, Power up, Tap in—to a world of information. With T7 Plus CD Network Towers all it takes is one cable to make your network connection—and it's included with the CD Tower. So is the software. In fact, you get everything you need to make a Plug-and-Play network connection.

Each Tower has two Ethernet ports or two Token Ring ports, so you can choose the cable type that best suits your current network.

In either case, the Tower autosenses the active port as soon as you plug in the cable. Just make the network connection, and you're ready to go to work.

The Tower for Novell NetWare includes software that installs easily on your server. The Windows NT model is a firmware solution only, so there's no additional software to load.

Choose the T7 Plus Tower to turn a simple LAN link into a *total CD-ROM solution!*

SPECIFICATIONS

Average Access Time — 220 ms (quad)
Data-Transfer Rate — 600 Kbps (quad)
Standards — 10BASE-T, 10BASE2, and 16/4 Mbps Token Ring via UTP/STP wiring
System Requirements — For Novell models: Novell NetWare 3.11 or higher;
For Windows® models: Windows NT, Windows for Workgroups, Windows® 95, UNIX®
Connectors — CDTE300A-7-R4: (1) RJ-45, (1) BNC;
CDTT300A-7-R4: (1) RJ-45, (1) DB9;
CDTE350A-7-R3: (1) RJ-45, (1) DB15;
CDTT350A-7-R3: (1) Type 1 Data, (1) RJ-45 Type 3
Power — 115/230 VAC, 60/50 Hz, switch-selectable
Size — 19.3"H x 7.5"W x 11.7"D (49 x 19.1 x 29.7 cm)
Weight — 45 lb. (20.4 kg)

Item	Code	Price
T7 Plus CD Network Tower for Novell NetWare		
Ethernet	CDTE300A-7-R4	**$5195.00**
Token Ring	CDTT300A-7-R4	**$5495.00**
T7 Plus CD Network Tower for Windows NT		
Ethernet	CDTE350A-7-R3	**$5195.00**
Token Ring	CDTT350A-7-R3	**$5495.00**

OMNI Towers

The Future of CD-ROM Networking Is Now—and OMNI Towers over the Competition!

- **Now has 12X speed drives!**
- **Ready for the future—all key components are easily replaceable or upgradable. Swap CD-ROM or other SCSI components.**
- **Network-direct connectivity in Novell® or Windows NT™ environments over Ethernet and Token Ring networks.**
- **Adapts from standalone to rackmount configurations.**

12X speed drives!

*Seven drives **plus**. The OMNI Tower also includes a Personality Module ready for your network and a Drive Cell to link any SCSI-2 device to the Tower data bus.*

Get true scalability and upgradability in CD-ROM networking with the OMNI Modular CD-ROM Tower. The OMNI Tower is designed to grow with the rapid advances in technology—and to meet increasing demands on your CD-ROM network for years to come. Here's why:

Scalable

A single OMNI Tower with 7 drives can also be configured as a 14-drive Twin Tower. Create configurations from 7 to 196 drives!

Modular

Along with 7 CD-ROM drives, each Tower also comes with a fully integrated hardware/software Personality Module. The Module provides network-direct connectivity in Novell® or Windows NT™ environments over Ethernet and Token Ring networks.

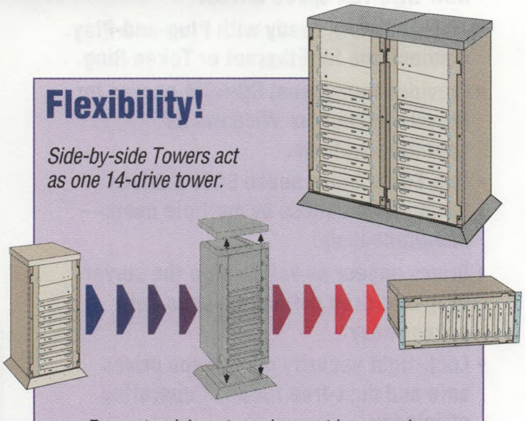
The OMNI Tower also features a hot-swappable Drive Cell, which enables you to mount and link any SCSI-2 device to the chassis data bus. But the Drive Cell's premier advantage is that the OMNI Tower can incorporate leading-edge storage technologies instantly. Your Tower isn't defined by the drives currently installed but by its ability to deploy new storage technologies as they come to market!

Rackmountable

Rackmounting the OMNI Tower is as easy as sliding the chassis into a standard 19" frame. The rackmount ears are built right into the chassis. Just remove the unit's top and bottom and rack it!

Fault-Tolerant

With the OMNI Tower, there is no single point of failure. All system components are interchangeable and hot-swappable to ensure easy upgrades and on-the-fly network reconfigurations. And each chassis can be fitted with an optional backup power supply—and that higher availability means no network downtime.



Flexibility!

Side-by-side Towers act as one 14-drive tower.

From standalone to rackmount in seconds—no additional hardware required. The top and bottom panels are removable to make the Tower rackmountable.

Added Extras

The OMNI Tower also comes with status-indicator lights, dual cooling fans, and a locking security door that deters theft and keeps out dust. The Tower is also UL® listed and FCC-B certified.

Make Plans for the Future

Prepare yourself for tomorrow's CD-ROM networking needs. With the OMNI Modular CD-ROM Tower, you're ready for next-generation technology and increased networking demands!

NOTE: All OMNI Towers include seven high-performance SCSI CD-ROM drives, dual fans, autosensing power supply (90–264 VAC), locking security door, and sidemount flanges for use in standard 19" racks.

FAXBACK INFORMATION
Request Document Number: 16201
Call 412-746-5500 Anytime

Item	Code	Price
OMNI Tower with 7 CD-ROM Drives		
SCSI	CD107A-R3	**$4995.00**
Ethernet/Novell	CD227A-R3	**$5995.00**
Ethernet/Windows NT	CD257A-R3	**$5995.00**
Token Ring/Novell	CD327A-R3	**$6295.00**
Token Ring/Windows NT	CD357A-R3	**$6295.00**
You may also need:		
Hot-Swappable 300W Power Supply (redundant)	CD090	**$329.00**

Black Box Explains...

What's Next in CD-ROM.

A single CD-ROM today can hold up to 650 MB of information—the equivalent of 130,000 pages of text or 450 floppy disks. That's impressive, but the *new* generation of CD-ROM, called DVD (Digital Video Disc), is becoming available and has the storage capacity of *7 to 26 times* more than a conventional CD.

Networks of the future will balance the cost of various data-storage media with the projected speed requirements of retrieving it. CD-ROM already represents a very cost-effective way to make gigabytes of data available to workgroups. Recordable and rewritable CD-ROM drives will accelerate this trend. Eventually, CD-ROM subsystems filled with inexpensive terabytes of blank media will be the data warehouse of the future. And, to top it off, recordable and erasable CD-ROM drives and media are becoming more affordable every day.

How can you take advantage of CD-ROM today without paying the price of obsolescence in the future? Flexible, upgradable tower systems are designed to accomodate new technologies when they become available.

CD-R Tower

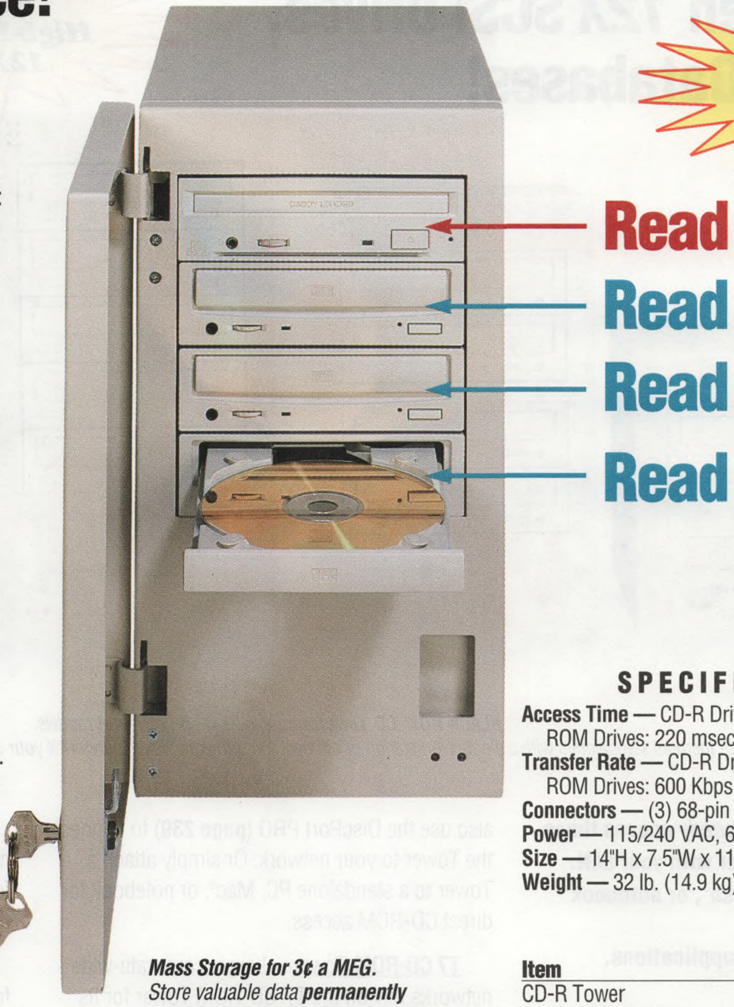
Archive Data and Make It Available to Your *Entire* Workgroup with Just One Device!

- **Now has 12X speed drives.**
- **Dual-speed CD-R drive keeps pace with your hard disk. Great for writing archival discs and multimedia prototypes.**
- **Built-in SCSI host adapter provides a direct network link and access for all valid users.**
- **Quad-speed read-only drives support fast, multi-user access to multiple volumes.**

Our combination read/write CD-R Tower enables you to consolidate data from multiple sources such as e-mail, databases, and multimedia presentations, and you can create tamper-proof, archive-quality master or backup CDs. Get the power and flexibility to control data any way you choose.

With a high-speed SCSI port to connect in any environment, the RT4 is designed for use in a variety of applications. Use it as a data warehouse for an entire CD library. Make it the centerpiece of your mass-storage archival operation. Back up images, publications, even full-motion video—up to 650 MB on just one disc. Then play them back on any standard CD-ROM drive, for yourself, network users, or an entire audience in a lecture hall or conference center.

The mastering software you need to record discs is included *free.* It supports multi-session recording and multiple formats, giving you a variety of options to produce archive-quality CDs.



12X speed drives!

Mass Storage for 3¢ a MEG. *Store valuable data* ***permanently*** *on high-capacity CD Recordable Discs (***below***). Gold reflective layer ensures dependable read-back over the life of the disc.*

FAXBACK INFORMATION
Request Document Number: 15712
Call 412-746-5500 Anytime

SPECIFICATIONS

Access Time — CD-R Drive: 500 msec;
ROM Drives: 220 msec
Transfer Rate — CD-R Drive: 614 Kbps;
ROM Drives: 600 Kbps
Connectors — (3) 68-pin SCSI-3 I/O ports
Power — 115/240 VAC, 60/50 Hz
Size — 14"H x 7.5"W x 11.7"D (35.6 x 19 x 29.7 cm)
Weight — 32 lb. (14.9 kg)

Item	Code	Price
CD-R Tower		
for Windows®	CDT400A-R3	**$4295.00**
for Mac®	CDT410A-R3	**$4295.00**

CD-ROM Disc

CD-ROM Discs for Your Recordable Drives.

Store your valuable data permanently on these high-capacity, write-once recordable CDs. The durable-dye recording layer provides excellent protection against UV degradation and long-term security for your system backup data, archival information, even audio. A gold reflective layer ensures stable read-back characteristics over time.

Compatible with JVC, Kodak®, Phillips, Pinnacle, Micro, Pioneer®, and SONY® CD-ROM write-once drives. Each disc is packaged in a reusable jewel case for protective storage.

SPECIFICATIONS

Capacity — Data, 650 MB;
Audio, 74 minutes
Standards — Conforms to Orange/Yellow Book
CD standards
Size — 120 mm

Item	Code	Price
CD-ROM Disc (650 MB, 74 min)	CDD650	**$19.95**

SCSI CD Towers

Multiple Users Can Share up to Seven *12X* SCSI Drives. Great for Databases!

Now with
High-Perfomance
12X Drives
BLACK BOX®
T2 Dual CD Tower
BLACK BOX®
T4 Four CD Tower
BLACK BOX®
T5 Five CD Tower
BLACK BOX®
T7 Seven CD Tower

***BLACK BOX® CD Towers** come in 2-, 4-, 5-, or 7-port models.*
Use them as standalones with a single workstation or connect them to your Novell network if your server has SCSI connectors.

- **SCSI interface offers *speedy* access times.**
- **Use either standalone or with your LAN.**
- **Work with PC, Macintosh®, or notebook computers.**
- **Ideal for multiple-disc applications.**

BLACK BOX® SCSI CD Towers simultaneously bring volumes of data to multiple users—in a flash! Depending on the drives in your Tower, up to two, four, five, or seven users can tap into business records, library records, or reference resources at the same time. If your business is data-intensive, these Towers are just what you need.

Search through a database with one drive while you access another drive. It's no problem—switch access is practically seamless. You can even switch back and forth between a Tower's drives at the same time as others do. For maximum versatility, multiple users can access the same disc at the same time.

You can connect a Tower directly to a Novell® LAN server equipped with a SCSI adapter. If your LAN server doesn't have a SCSI card, you may also use the DiscPort PRO (**page 239**) to connect the Tower to your network. Or simply attach a Tower to a standalone PC, Mac®, or notebook for direct CD-ROM access.

T7 CD-ROM Tower—Large, corporate-wide networks rely on the T7 CD-ROM Tower for its high-speed drives, ease of use, and access to massive amounts of information that otherwise would take up *thousands* of volumes of paper. Its 256-KB on-board buffer and special data-flow management provide increased data-transfer rates.

T5 CD-ROM Tower—If your department or small corporation is rapidly growing and adding users to its network, the BLACK BOX® T5 CD-ROM Tower gives you an added drive and the advantage of quick access to even more information vital to your company.

T4 CD-ROM Tower—For large department networks, the BLACK BOX® T4 CD-ROM Tower features faster transfer speeds and greater reliability than what the competition promises.

T2 CD-ROM Tower—The ideal reference tool for small-sized departmental networks, with the speed and capabilities of larger departments' CD-ROMs! The T2 CD-ROM Tower lets network users access multiple discs and search back and forth between drives.

All four BLACK BOX® CD-ROM Towers come with powerful and quiet cooling fans, and double shutters for added dust protection and product reliability. And they meet FCC-B and UL® standards for product quality and safety. If your growing business relies on information, you can rely on Black Box to help you manage it.

NOTE: SCSI CD Towers are CE approved.

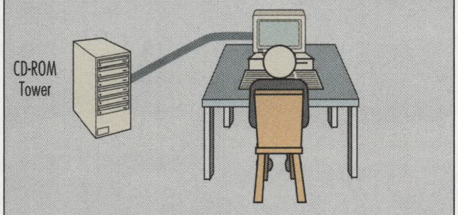
FAXBACK INFORMATION
Request Document Number: 14986
Call 412-746-5500 Anytime

Item	Code	Price
SCSI CD Towers		
T7 (7 Drives)	CDT300A-7-R5	**$4495.00**
T5 (5 Drives)	CDT300A-5-R5	**$3495.00**
T4 (4 Drives)	CDT300A-4-R5	**$2595.00**
T2 (2 Drives)	CDT300A-2-R5	**$1395.00**

DiscPorts

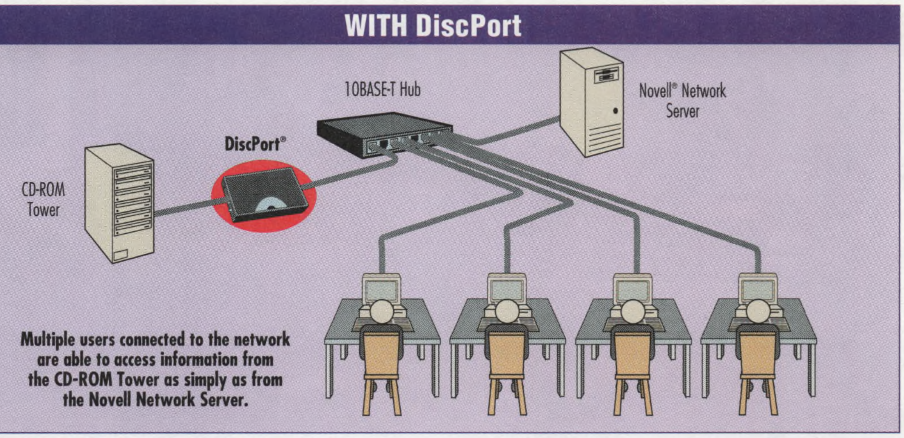
Access CD-ROM over Your Network.

BEFORE DiscPort



Single workstation connected to CD-ROM via SCSI. Only one person can access information at a time from a single location.

WITH DiscPort



Multiple users connected to the network are able to access information from the CD-ROM Tower as simply as from the Novell Network Server.

Single SCSI Port for up to 4X CD-ROM Drives
discport
BLACK BOX

DiscPort LAN Access Unit, (CDE300A)

DiscPort LAN Access Unit:

- **Adds CD-ROM access to your Ethernet or Token Ring LAN.**
- **Attach up to 7 quad-speed CD-ROM drives through a single SCSI port.**
- **Microsoft® Windows® compatible.**

Simply plug a DiscPort® LAN Access Unit between your Ethernet or Token Ring LAN and a SCSI CD-ROM drive or Tower, and you've added CD-ROM access to your entire Novell® network! Each drive becomes a NetWare® volume. Just map a drive letter or use DiscView® Software for Windows.

DiscView software menus make it easy to manage all attached CD-ROM drives from your PC. Plus you can take advantage of NetWare file services like drive mapping, disk caching, and security.

Remember that Black Box CD Network Towers are already configured for Novell or Windows NT™ and don't require a DiscPort.

What Comes with the DiscPort LAN Access Unit and DiscPort PRO:

- AC adapter
- DiscView software for Windows and DOS
- Software manual
- CD-ROM Tower-to-DiscPort SCSI cable

DiscPort PRO:

- **Easy to use, plug-and-play installation: CD-ROM miniserver.**
- **For Novell NetWare (PC or Mac®), Windows, and Windows NT.**
- **Now supports Windows NT 4.0 and Novell IntraNetware.**
- **Enables all network users to access *quad-speed or faster* networked CD-ROMs.**
- **Attaches up to 14 CD-ROM drives through dual SCSI ports.**
- **Perfect for linking SCSI CD Towers (page 238) to your Novell network.**

Need more power? The DiscPort PRO is a high-performance CD-ROM miniserver that allows network users to share multiple CD-ROM drives! It supports quad-speed or faster CD-ROM drives on your 10-Mbps ThinNet or 10BASE-T network, and also supports CD-ROM changers.

The included DiscView software automatically prepares CD-ROMs so users can access information as simply as they access a file server. The software also gives users "drag and drop" access to mounted CDs, enabling them to manage groups of CD-ROMs.

Attach the DiscPort PRO anywhere on your ThinNet or 10BASE-T network. It eliminates the need to connect CD-ROM drives directly to the file server or locally to each network workstation. If you have a Windows NT network, the compatible DiscPort PRO allows one-stop management of all networked DiscPort PROs and CD-ROMs.

With just one DiscPort PRO, network users can access up to 14 CD-ROM drives or changers. Just think of the number of CDs accessible with multiple DiscPort PROs!

Two SCSI Ports for 4X or faster CD-ROM Drives

DiscPort PRO, (CDE400A)

SPECIFICATIONS

System Requirements — CDE300A, CDT301A: Novell NetWare 3.11 or higher; PC running DOS 3.3, Windows 3.1, or higher; 16/4-Mbps Token Ring, 10BASE-T, or ThinNet via UTP/STP wiring; at least 8-MB RAM required for file server; CDE400A: Novell NetWare 3.11, Windows NT 3.51, or higher; PC running DOS 3.3, Windows 3.1, or higher; 10BASE-T or ThinNet via STP wiring; at least 16-MB RAM required for file server

CE Approval — Available (CDE300AE, CDT301AE, CDE400AE, 230-VAC versions)

Connectors — CDE300A: (1) RJ-45 female (10BASE-T), (1) BNC female (ThinNet); CDT301A: (1) RJ-45 female (UTP), (1) DB9 female (STP); CDE300A, CDT301A: (1) DB25 female SCSI-2, (1) power; CDE400A: (1) RJ-45 female, (1) BNC female, (2) HD50 SCSI female, (1) power

Power — AC adapter

Size — CDE300A, CDT301A: 1"H x 4"W x 7.5"D (2.5 x 10.2 x 19.1 cm) CDE400A: 1.5"H x 9.8"W x 6.8"D (3.8 x 24.9 x 17.3 cm)

Weight — 2.3 lb. (1 kg)

FAXBACK INFORMATION
For CDE400A-R2: Document 14649
Call 412-746-5500 Anytime

Item		Code	Price
DiscPort LAN Access Unit	Ethernet (10BASE-T or ThinNet)	CDE300A	**$495.00**
	Token Ring	CDT301A	**$995.00**
DiscPort PRO		CDE400A-R2	**$995.00**

BLACK BOX
ServSwitch™
Basic
BLACK BOX
(412) 746-5500
READY
CPU SELECT
POWER
CPU 1
CPU 2
CPU 3
CPU 4

Sometimes the Inexpensive Solution… …Is Equal to the Expensive Solution.

Like when you use a BLACK BOX® Switch in place of more expensive peripherals. With a BLACK BOX® Switch, two or more PCs can share a peripheral such as a printer or CD drive. You save and your users get the peripherals they need.

And in many cases, as with the ServSwitch, buying a switch instead of the peripherals is not only the less-expensive solution, but also the more practical solution.

The inexpensive solution *can* be equal to the expensive solution, and sometimes it's even better.

Manual Switches.

Manual Switches are smart-priced solutions for jobs that don't need memory, buffering, or spooling. Black Box has just about any Manual Switch you need—rackmount or standalone.

Can't find your switch? We'll custom-build it for you! And just like all Manual Switches, it's guaranteed for life! Find out more, on **pages 248–249.**

Electronic Switches.

Control your connections with one phone call, share SCSI devices between PCs—even take control of automated factory devices!

See **pages 252–269** and find out what electronic switching can do for you.

The ServSwitch.

Want to share one CPU between several workstations? Or control several CPUs from one monitor and keyboard? Here are the ultimate Keyboard/Video Switches! You can eliminate needless hardware expenses, clean up the clutter in your computer room, and save time. Because a BLACK BOX® ServSwitch enables you to control multiple servers from a single workstation. *You can even manage multiple computer applications on multiple platforms.* Put *total* control at your fingertips with BLACK BOX® Serv Series Switches (**pages 270–287**)!

Keyboard/Video Switches.

Keyboard/Video Switches (**pages 288–293**) are our versatile manual switches. Use them wherever you need to share images or maintain control from a single location.

BLACK BOX® Keyboard/Video Switches are available in both manual and electronic models. Whether you want to share monitors with a single computer, control multiple Mac®, Sun®, or PC computers from a single workstation, or develop a comprehensive system to monitor and manage your network servers—we have your switch.

If you don't see the exact configuration you need, we'll gladly customize a solution for you!

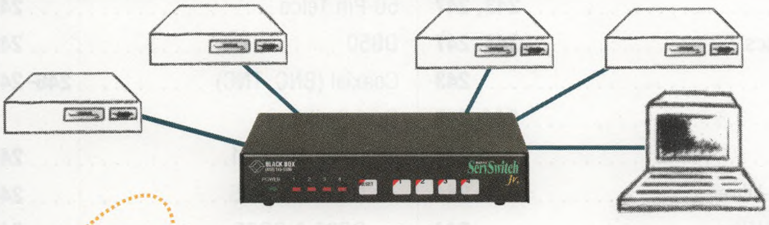
BLACK BOX® ServSwitch™
technology

BLACK BOX
SOLUTIONS
Over 7000 Connectivity Solutions!

"We're adding more servers to our network. It's expensive and inconvenient to provide a monitor and a keyboard for each server."

The BLACK BOX® ServSwitch saves you money on hardware and simplifies your network!

Plug up to 16 computers into a ServSwitch and control all of them from a *single keyboard, mouse, and monitor!* It's no wonder the ServSwitch is such a hit with our customers. There's a BLACK BOX® Serv Series Switch to fit every installation—single-user, multi-user, on-screen menus, modular expansion—you name it, we have it. For more details, see **pages 270–287**.

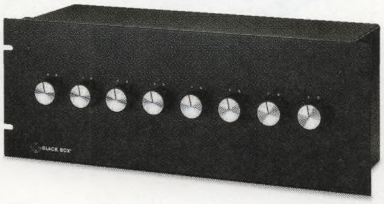


BLACK BOX
SOLUTIONS
Getting It Right the First Time!

"As our company grows, our switch clutter grows. I'd like to rackmount our switches, but I can't seem to find the right combination of switches in a rack chassis."

Black Box Rackmountable Switches are custom-made for your growing needs.

The last thing you need at your busy central site is clutter. At Black Box, we'll build the switches *you need* into a standard or mini rackmount chassis. So all your switches can be neatly mounted in any standard rack—no more nests of messy cable and rows of individual boxes. See **pages 248–249** for details about BLACK BOX® Customized Rackmount Switches.



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MORE! Switches, see **HOT NEW PRODUCTS**

FOR *FAST* TECH SUPPORT,
Call **412-746-5500**

PRESS **1,2,1** CONVERSION
Interface Converters, Twinax/UTP & Baluns, Protocol Converters, **SCSI**, **Bar Code**

PRESS **1,2,2** CONNECTIVITY
Printer Devices, Cables/Connectors, **Switches**, Tools/Racks, Equipment Protection/Testers

Or if You Prefer:
Fax Us at: 412-746-0746.
E-mail Us at: info@blackbox.com

FREE
ServSwitch Jukebox Poster
between pp. 290 & 291.

ServSwitch

Manual Switches for Every Job.

Any manual switch you need. Black Box has the switch—rackmount or standalone—for *every* application. If you don't see it in the Catalog, send us the specs. We'll build it for you!

Why manual switches? They're a low-cost solution for applications that don't require memory, buffering, or spooling (sharing a printer among multiple CPUs, for example). They're nonpowered, so you can install them anywhere. ***And they're guaranteed for life!***

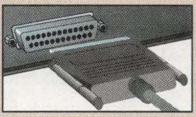
It's easy to order manual switches. Answer these three questions and you're ready to order:

- *Which connectors do I need?*
- *How many devices am I connecting?*
- *Do I need a standalone or rackmount chassis?*

Here's Where You'll Find:

Manual *Standalone* Switches ....**pp. 242–247**
Manual *Rackmount* Switches ....**pp. 248–249**

Which Connector Style?



Know your connectors. The first step in ordering a switch is finding out what connectors are on your *existing* cables and computer equipment. This ensures that you can connect your new switch when it arrives.

Also, a switch *must* be able to support the same pinning as your computer equipment. For example, of the 25 electrical leads in a DB25 connector, only 4 (or 12) of them might be active. So before you order, consult the operating manual that came with your computer equipment to determine how many (and which) leads your new switch needs to support. For further information, call Tech Support at **412-746-5500**.

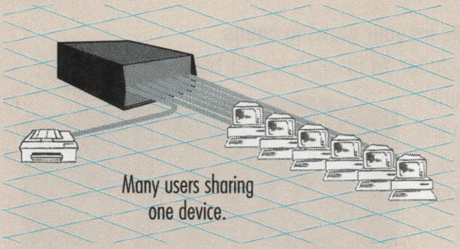
SWITCHES AVAILABLE BY CONNECTOR STYLE

Connector	Page	Connector	Page
DB25	**243, 247**	50-Pin Telco	**245**
Centronics®	**243, 247**	DB50	**246**
DB9	**243**	Coaxial (BNC, TNC)	**246–247**
DB15	**244–245**	Dual Switches	
DB37	**244**	DB25 & RJ-11	**246**
RJ-11 6-Wire	**244**	DB25 & RJ-45	**246**
RJ-45 8-Wire	**244**	DB25 & DB25	**246**
6-Wire Modified Modular Jack	**244**	DB25 & 4-Wire Terminal Strip	**246**
4-Position Terminal Block	**244**	Dual BNC	**246**
IEEE-488	**245**	50-Pin Header	**246**
34-Pin Winchester	**245**	M/50	**246**
Mini 8-pin DIN	**245**	Twinax	**247**

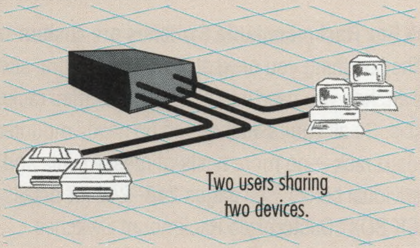
How Many Devices?

Know the number of devices you're connecting, and how you want to connect them. That will determine the specific kind of switch you need. With ABC Switches two users can share one peripheral, or a single user can choose between two devices. ABCDE Switches enable four users to share one device, or one user to choose from four peripherals. With X-Switches two users can share two devices. And dual switches enable two connectors to be switched simultaneously.

Many to 1



X-Switch



Which Chassis Style?

Know the chassis style you need: ***Standalone or Rackmount***.

***Standalone* Chassis Style A**
Size — 2.5"H x 6"W x 6.3"D (6.4 x 15.2 x 16 cm)
Weight — 1.5 lb. (0.7 kg)

***Standalone* Chassis Style B**
Size — 3.5"H x 6"W x 6.3"D (8.9 x 15.2 x 16 cm)
Weight — 1.5 lb. (0.7 kg)

You'll find Standalone switches on **pages 243–247**.

***Rackmount* Standard Chassis**
Size — 7"H x 19"W x 5.9"D (17.8 x 48.3 x 15 cm)

***Rackmount* Mini Chassis**
Size — 3.5"H x 19"W x 5.9"D (8.9 x 48.3 x 15 cm)

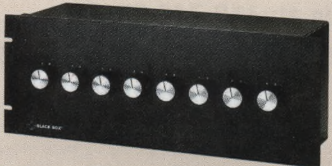
You'll find Rackmount switches on **pages 248–249**.

A B
BLACK BOX
ABC SWITCH

Standalone Chassis A

A B C D E
BLACK BOX
ABCDE SWITCH

Standalone Chassis B



Rackmount Standard Chassis

Rackmount Mini Chassis

ABSOLUTELY GUARANTEED FOR LIFE

Manual Switches

(Descriptions of chassis styles on facing page.)

Lifetime DB25 Switches

CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!
C
B
A
13
25-Pin
1
25
14
DB25 female

- Tested to 25,000 use-cycles to ensure reliability.
- Share printers, modems, or other peripherals.

ABC 25-Lead Switch Ready Pak—Two 10-ft. DB25M/DB25M cables (ECM25C-0010-MM) plus one 6-ft. DB25M/Centronics® Parallel Printer Cable (EYN600-0006-MM).

ABC 12-Lead Switch Ready Pak—One 10-ft. DB25M/DB25M cable (ECM25C-0010-MM) plus two 10-ft. DB9F/DB25M AT® Serial Printer Cables (EVMBPC-0010).

ABCDE 25-Lead Switch Ready Pak—Four 10-ft. DB25M/DB25M cables (ECM25C-0010-MM) plus one 6-ft. DB25M/Centronics Parallel Printer Cable (EYN600-0006-MM).

FAXBACK INFO
Request Document Number: 10140
Call 412-746-5500
Anytime

Item	Chassis Style	Code	Price
ABC-25 (2 to 1) Switches	**A**		
25 Leads, Serial or Parallel (for PC Users)		SWL025A	**$49.95**
12 Leads		SWL088A	**$45.00**
4 Leads		SW084A	**$74.00**
ABC-25 (2 to 1) Switch Ready Paks			
25-Lead Switch Ready Pak Includes the Switch, **plus** (**2**) RS-232 Cables **and** (**1**) Parallel Printer Cable		SWL025A-FFF-CABPAK	**$111.80**
12-Lead Switch Ready Pak Includes the Switch, **plus** (**2**) AT Serial Printer Cables **and** (**1**) RS-232 Cable		SWL088A-FFF-CABPAK	**$92.85**
ABC-25 EMI/RFI			
25 Leads	**A**	SWL023A	**$59.95**
ABC-25 Monitor Switch			
24 Leads	**A**	SW015A	**$112.00**
ABC-25 Lock-Up Switch, Key-Operated			
24 Leads, Pin 1 Tied Common	**B**	SW020A	**$142.00**
ABCDE (4 to 1) Switches	**B**		
25 Leads, Serial or Parallel (for PC users)		SWL026A	**$79.00**
12 Leads		SWL058A	**$69.95**
4 Leads		SW054A	**$117.00**
ABCDE (4 to 1) Switch Ready Paks			
25-Lead Switch Ready Pak Includes the Switch, **plus** (**4**) RS-232 Cables **and** (**1**) Parallel Printer Cable		SWL026A-FFFFF-CABPAK	**$188.75**
ABCDE-25 EMI/RFI, 25 Leads	**B**	SWL024A	**$79.00**
ABCDE-25 Monitor Switch			
24 Leads	**B**	SW055A	**$170.00**
X-Switch (2 to 2)	**A**		
25 Leads, Serial or Parallel (for PC Users)		SWL027A	**$75.00**
12 Leads		SW100A	**$127.00**
6 to 1 Switch (DB25)			
Parallel 12 Leads	**A**	SW059A	**$200.00**
Serial 25 Leads	**A**	SWL090A	**$89.95**

remember to order cables RS-232 Cable, 10-ft. (3.0-m) ECM25C-0010 **$23.95**

For other lengths, see p. 83.

◆ ◆ ◆

Lifetime Switches for Centronics

36-pin Centronics® female

- Ideal for parallel-printer sharing.
- Use the cable you already have.

Item	Leads	Chassis Style	Code	Price
Lifetime Switches for Centronics				
ABC (2 to 1)	36	**B**	SW250A	**$55.00**
ABCDE (4 to 1)	24	**B**	SW260A	**$89.00**
X (2 to 2)	24	**B**	SW270A	**$145.00**

remember to order cables Centronics® Extension Cable, 10-ft. (3.0-m) Male/Male BC00102 **$11.95**

For other lengths, see page 105.

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DB9 Switches

CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!
B
A
C
E
D
DB9S female

- For PC-, printer-, plotter-, and modem-sharing applications.
- Supports 9 leads.

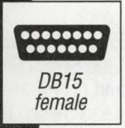
Item	Chassis Style	Code	Price
DB9 Switches			
ABC (2 to 1)	**A**	SWL030A	**$45.00**
Lock-Up	**B**	SW034A	**$133.00**
ABCDE (4 to 1)	**B**	SWL031A	**$69.95**
X (2 to 2)	**A**	SW033A	**$118.00**
6 to 1	**B**	SW035A	**$143.00**
ABC DB9 Switch Ready Pak Includes the 2-to-1 Switch **plus** (**3**) 10-ft. DB9 Cables		SWL030A-FFF-CABPAK	**$113.85**

remember to order cables DB9 Extension Cable, 10-ft (3.0-m) Male/Female EDN12H-0010-MF **$22.95**

For other lengths, see page 105.

(Descriptions of chassis styles on page 242.)

DB15 Switches


DB15 female

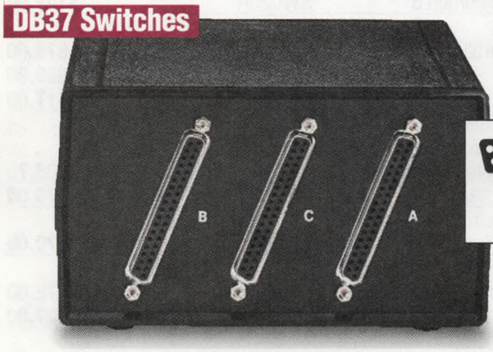
- For Apple® Macintosh® video connections.
- Supports 15 leads.

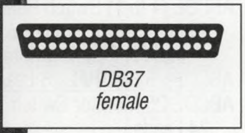
Item	Chassis Style	Code	Price
DB15 Switches			
ABC (2 to 1)	A	SW040A	$59.00
ABC (Lock-Up)	B	SW044A	$79.00
ABCDE (4 to 1)	A	SW041A	$99.00
X (2 to 2)	A	SW043A	$129.00
remember to order cables: DB15 Thumbscrew Cable, 10-ft. (3.0-m)		EGM16E-0010-MM	$25.95

For other lengths and genders, see page 110.

Looking for a Macintosh Keyboard/Video Switch? See our...
Macintosh Switches **See page 290.**

DB37 Switches




DB37 female

- For RS-449-standard connections.
- ABCDE and X-Switches support 24 leads.
- ABC Switch supports 37 leads.

Item	Chassis Style	Code	Price
DB37 Switches			
ABC (2 to 1)	B	SWL350A	$69.95
ABCDE (4 to 1)			
Specialty-pinning	B	SW360A	$189.00
Bernoulli® Switch	B	SW014AX	$200.00
X (2 to 2) (specify pinning)	B	SW370A	$174.00
remember to order cables: DB37 Interface Cable, 10-ft. (3.0-m) Male/Male		EDN37J-0010-MM	$43.95

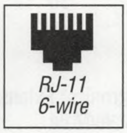
For other lengths and genders, see page 110.

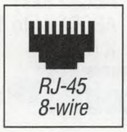
RJ-11 & RJ-45 Switches

PLUS! For LAN appplications, see our Ethernet Switches on pp. 474–487.

- For telephone lines and RS-232.
- RJ-11 switches support 6 leads.
- RJ-45 switches support 8 leads.

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!


RJ-11 6-wire


RJ-45 8-wire

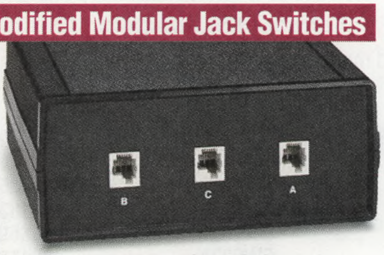
Item	Chassis Style	Code	Price
RJ-11 Switches			
ABC (2 to 1)	A	SWL036A	$45.00
RJ-11 ABC Switch Ready Pak Includes the Switch **plus** (3) 7-ft. RJ-11 Cables		SWL036A-CABPAK	$53.85
ABC (Make-Before-Break)	A	SW075A	$102.00
ABCDE (4 to 1)	A	SWL037A	$59.00
6 to 1	B	SW076A	$112.00
RJ-45 Switches			
ABC (2 to 1)	A	SWL060A	$45.00
RJ-45 ABC Switch Ready Pak Includes the Switch and (3) 7-ft. RJ-45 Cables		SWL060A-CABPAK	$59.85
ABCDE (4 to 1)	A	SW061A	$122.00
6 to 1	B	SW077A	$133.00
remember to order cables: RJ-11 Modular Cable, 7-ft (2.1-m), straight-pinned		EL04MS-07	$2.95

For other lengths and pinnings, see page 71

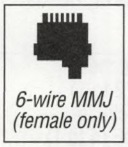
RJ-45 Modular Cable, 7-ft (2.1-m), straight-pinned		EL08MS-07	$4.95

For other lengths and pinnings, see page 71

Modified Modular Jack Switches



- For your DEC™ connections.
- Supports 6 leads.

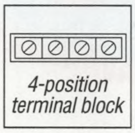

6-wire MMJ (female only)

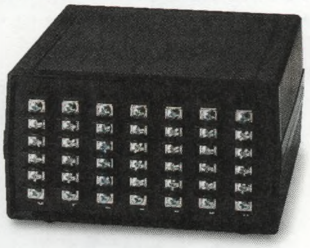
Item	Chassis Style	Code	Price
ABC (2 to 1)	A	SW691A	$154.00
ABCDE (4 to 1)	A	SW696A	$170.00
X (2 to 2)	A	SW693A	$164.00
6 to 1	B	SW694A	$180.00
remember to order cables: DEC 423 MMJ Cable *(DEC Part#: BC16E)*, 10-ft. (3.0-m)		EHM007-0010	$3.95

For other lengths, see page 70.

4-Wire Utility Switches

- For your current-loop applications.
- Supports 4 leads.


4-position terminal block



Item	Chassis Style	Code	Price
ABC (2 to 1)	B	SW800A	$92.00
ABCDE (4 to 1)	B	SW810A	$133.00
6 to 1	B	SW830A	$143.00
remember to order cables: Category 3 Solid Bulk Cable, 2-Pair, PVC, 500-ft. (152-m)		EYN712A-0500	$29.95

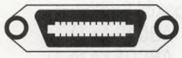
For other lengths, see p. 116.

ABSOLUTELY GUARANTEED FOR LIFE

Switches

(Descriptions of chassis styles on page 242.)

IEEE-488 Switches


IEEE-488 female

- For your HP®-IB, GPIB interface connections.
- Supports 24 leads.

Item	Chassis Style	Code	Price
IEEE-488 Switches			
ABC (2 to 1)	B	SWL300A	$75.00
ABCDE (4 to 1)	B	SW310A	$235.00
X (2 to 2)	B	SW320A	$215.00
remember to order cables — IEEE-488 Cable (Molded Connectors), 6.6-ft. (2.0-m) *(HP® Part #9643M)*		EXN02M	$69.95

For other lengths, see page 87.

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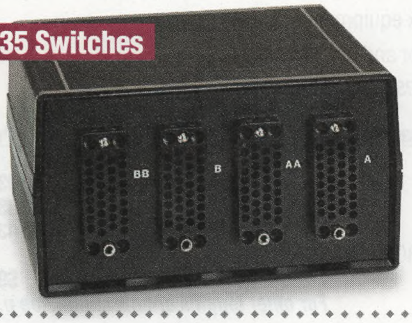
V.35 Switches



34-pin Winchester®

- For your CSU/DSU connections.
- Supports 17 leads—pins A–F, H,P, R–Y, AA.

Item	Chassis Style	Code	Price
V.35 Switches			
ABC (2 to 1)	A	SWL751A	$75.00
ABCDE (4 to 1)	B	SW752A	$250.00
X (2 to 2)	B	SW753A	$235.00
remember to order cables — V.35 Interface Cable, 10-ft. (3.0-m) Male/Male		EYN450-0010-MM	$83.95

For other lengths or genders, see p. 89.

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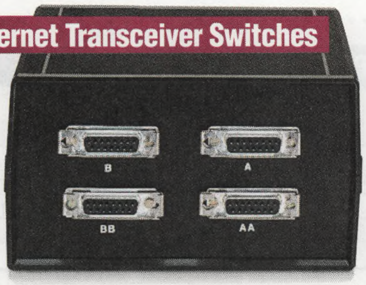
Ethernet Transceiver Switches



DB15S female

- For switching between your Ethernet LANs.
- Supports 15 leads.

Item	Chassis Style	Code	Price
Ethernet Transceiver Switches			
ABC (2 to 1)	A	SW045A	$108.00
ABCDE (4 to 1)	B	SW046A	$153.00
remember to order cables — Industrial Ethernet Transceiver Cable, 10-ft. (3-m) PVC		LCN200-0010	$55.95

For other lengths, see page 78.

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Mini 8-Pin DIN Switches

B
C
A
A B
BLACK BOX®
ABC SWITCH

Mini 8-pin DIN female

- A versatile Switch for your Sun® and Macintosh® applications.
- Supports 8 leads.

Item	Chassis Style	Code	Price
Mini 8-Pin DIN Switches			
ABC (2 to 1)	A	SW340A	$77.00
remember to order cables — Switch Box Cable, 6-ft. (1.8-m)		EVMK8-0006-MM	$22.95

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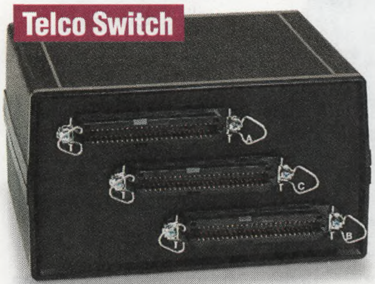
Telco Switch



- For your SCSI and telephone applications.
- Supports 1-50 leads.

50-pin Telco female

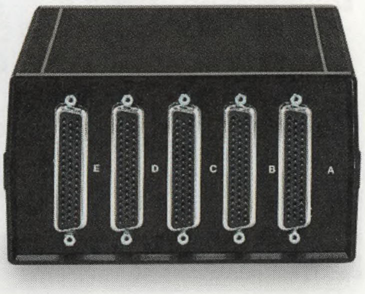
Item	Chassis Style	Code	Price
ABC (2 to 1)	B	SW872A	$205.00
remember to order cables — Telco-Type Connector Cable, 5-ft. (1.5-m) Male/Male		ELN25T-0005-MM	$19.95

For other lengths and genders, see p. 71.

DB50 Switches

- For Dataproducts®, Datapoint®, UNIVAC®, and other 50-pin interfaces.
- Supports 48 leads.

DB50S female



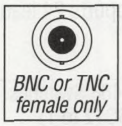
Item	Chassis Style	Code	Price
ABC (2 to 1)	B	SW400A	$184.00
remember to order cables — Flat (Ribbon) Cable, DB50 Male/Male		EY248-MM	$43.95 + $1.23/ft.

For other lengths, see page 88.

(Descriptions of chassis styles on page 242.)

Coax Switches

SW560A



- For your IBM® 3270 connections.
- Supports center conductor and shield leads.

NOTE: For LAN applications, call Tech Support.

Item	Chassis Style	Code	Price
Coaxial Switches			
ABC (2 to 1)	A	SWL550A	$45.95
ABCDE (4 to 1)	B	SW560A	$107.00
X (2 to 2)	A	SW570A	$97.00
6 to 1	B	SW580A	$117.00
remember to order cables: Coax Cable RG59 PVC, 10-ft. (3.0-m)		ETN62-0010-BNC	$9.95

For other lengths or bulk cable, see p. 79.

Dual BNC Coax Switches

SW630A

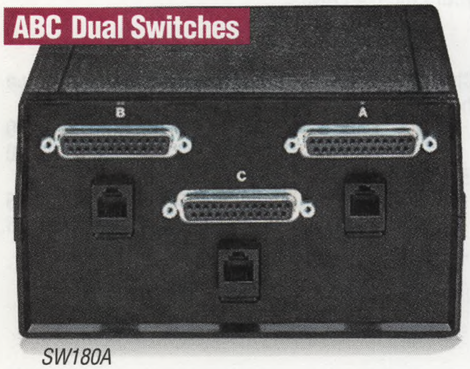
- Share your dual BNC coax equipment.
- Supports center conductor and shield leads.

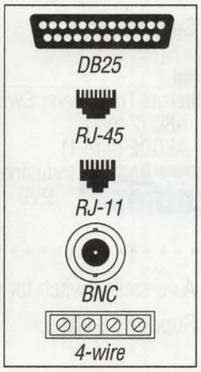
NOTE: For LAN applications, call Tech Support.

Item	Chassis Style	Code	Price
Dual BNC Coax Switches			
ABC (2 to 1)	A	SW630A	$103.00
ABCDE (4 to 1)	B	SW631A	$153.00
X (2 to 2)	A	SW633A	$143.00
remember to order cables: Coax Cable RG59 PVC, 10-ft. (3.0-m)		ETN62-0010-BNC	$9.95

For other lengths or bulk cable, see p. 79.

ABC Dual Switches


SW180A



- Two switches in one.

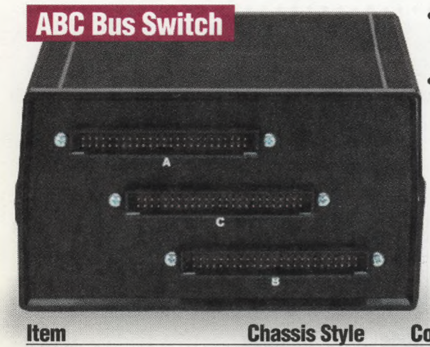
Each Switch includes two sets of ABC connectors on the back of the box. Turn the knob on the front panel to switch both sets to either the *A* or the *B* position simultaneously. Each port has two standard female connectors that can be switched simultaneously.

LEADS SUPPORTED, BY INTERFACE

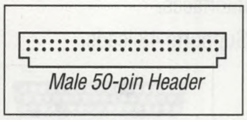
Switch Interface	Code	Leads Supported
DB25 and RJ-11	SW180A	DB25, all leads; RJ-11, 6 leads
DB25 and RJ-45	SW182A	All leads
DB25 and DB25 (for RS-232)	SW184A	Pins 2-25 switched; Pin 1 common
DB25 and DB25 (for IBM PC)	SW186A	Pins 1-24 switched; Pin 25 common
DB25 and 4-wire	SW188A	All leads
BNC and BNC	SW630A	Center conductor and shield

Item	Chassis Style	Code	Price
ABC Dual Switches			
DB25 and RJ-11	B	SW180A	$163.00
DB25 and RJ-45	B	SW182A	$163.00
DB25 and DB25			
for RS-232	B	SW184A	$163.00
for IBM PC	B	SW186A	$163.00
DB25 and 4-Wire Terminal Strip	B	SW188A	$163.00
Dual BNC	B	SW630A	$103.00
Connector Gender Change (DB25 only)			add $10.00

ABC Bus Switch

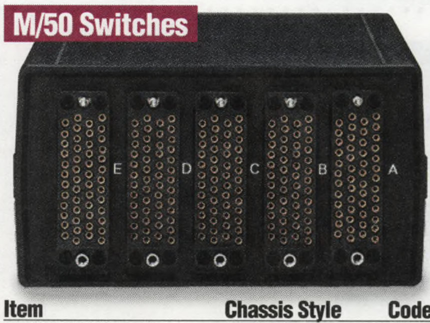


- For your Berg-type header connectors.
- Supports 48 leads.

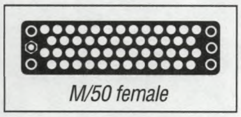


Item	Chassis Style	Code	Price
ABC Bus Switch	B	SW430A	$225.00
remember to order cables: Flat (Ribbon) Cable—50-Pin Berg (F/F) Female/Female		EY246	$15.10 + $1.23/ft.

M/50 Switches



- For high-speed M/50 parallel interfaces in Dataproducts, DEC™, and Printronix™ environments.
- Supports 24 leads.



Item	Chassis Style	Code	Price
ABCDE (4 to 1)	B	SW470A	$280.00
X (2 to 2)	B	SW480A	$260.00
remember to order cables: M/50 Connector Cable Male/Male		EYN500-MM	$79.95 + $1.35/ft.

In This Section...
Manual
Ganged

Switches

(Descriptions of chassis styles on page 242.)

BLACK BOX
PORT
1 2 3 4 5 6 7 8
DEVICE
A
B
C
D
4 x 8 Matrix Switch

Matrix Switches (4 x 4 and 4 x 8)

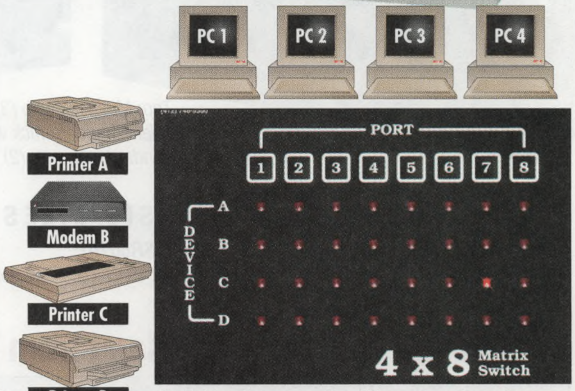
Four Peripherals among Eight Users—Sharing is Easier than Ever!

- **New faceplate makes switching and viewing your connected devices easier.**
- **Replace four smaller switches with one Matrix Switch and save money.**
- **Compatible with microcomputers and serial or parallel peripherals.**
- **Fast switching between devices.**
- **Bidirectional parallel IEEE Standard 1284-1994 compliant.**

Organize your resource sharing. With the Matrix Switch from Black Box, up to eight users can share any combination of up to four laser printers, plotters, or high-speed modems. Serial models are bidirectional, so four users can also share a generous network of up to eight peripherals. And because one Matrix Switch can replace as many as four smaller manual or electronic switches, you save money!

Now, the Matrix Switch is even easier to use. A front-panel grid indicates all possible input-to-output port connections. Simply choose any input to any output by pressing one button. A red indicator in the button tells you when the selection is made.

This Matrix Switch is ideal for all-PC offices, but you can use it with more than just PCs. Matrix Switches can connect any serial or parallel device. For instance, a cluster of minicomputers can share peripherals. You can connect any input to any output by pressing one button.


PC 1
PC 2
PC 3
PC 4
Printer A
Modem B
Printer C
Printer D
PORT
1 2 3 4 5 6 7 8
DEVICE
A
B
C
D
4 x 8 Matrix Switch

Switching is even easier with our new faceplate.

SPECIFICATIONS

Leads Supported — Serial: 2–6, 8, 15, 17, 19–20, 22, and 24, with Pin 7 common;
Parallel: All 25 pins

Speed — Up to 5 Mbps

CE Approval —Available (SW441AE-R2–SW444AE-R2, 230-VAC versions)

Interface — Serial: RS-232;
Parallel: IBM® PC compatible parallel; IEEE Standard 1284-1994 compliant supporting Compatibility and Nibble modes

Connectors — Serial: Input: DB25S female, Output: DB25S male;
Parallel: Input: DB25S male, Output: DB25S female

Power — 115 VAC, 60 Hz, 6 watts

Size — SW441A-R2–SW442A-R2: 3.5"H x 9"W x 7.5"D (8.9 x 23 x 19.1 cm);
SW444A-R2, SW443A-R2: 3.5"H x 13"W x 7.5"D (8.9 x 33 x 19.1 cm)

Weight — SW441A-R2–SW442A-R2: 3.9 lb. (1.8 kg);
SW444A-R2, SW443A-R2: 4.8 lb. (2.2 kg)

FAXBACK INFORMATION
Request Document Number: 17848
Call 412-746-5500 Anytime

Item	Code	Price
Matrix Switch (4 Users x 4 Peripherals)		
Serial	SW441A-R2	**$499.00**
Parallel	SW442A-R2	**$499.00**
Matrix Switch (4 Users x 8 Peripherals)		
Serial	SW444A-R2	**$745.00**
Parallel	SW443A-R2	**$745.00**

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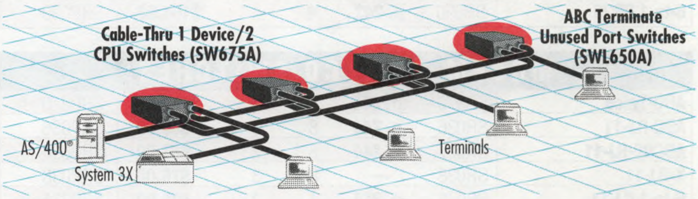
Twinax Manual Switches

ABSOLUTELY GUARANTEED FOR LIFE
SYSTEM B
TERMINAL
SYSTEM A

- Add hosts, workstations, and printers—without adding addresses.
- Access two—or four—different AS/400® or S/3X hosts at the flip of a switch.
- Put more users online with the ports you already have.

Twinax female

NOTE: Designed to log into one system at a time.


Cable-Thru 1 Device/2 CPU Switches (SW675A)
ABC Terminate Unused Port Switches (SWL650A)
AS/400®
System 3X
Terminals

Item	Code	Price
Twinax Manual Switches		
Cable-Thru 1 Device/2 CPU Switch		
Standalone	SW675A	**$205.00**
Rackmount	SR675	**$189.00**
Terminate Unused Port Switches		
ABC	SWL650A	**$45.95**
ABCDE	SW664A-R2	**$129.00**

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WANG Compatible Switches

ABSOLUTELY GUARANTEED FOR LIFE
BB
B
AA
A

- For your dual coax, BNC, and TNC WANG® connections.
- Supports center conductor and shield leads.

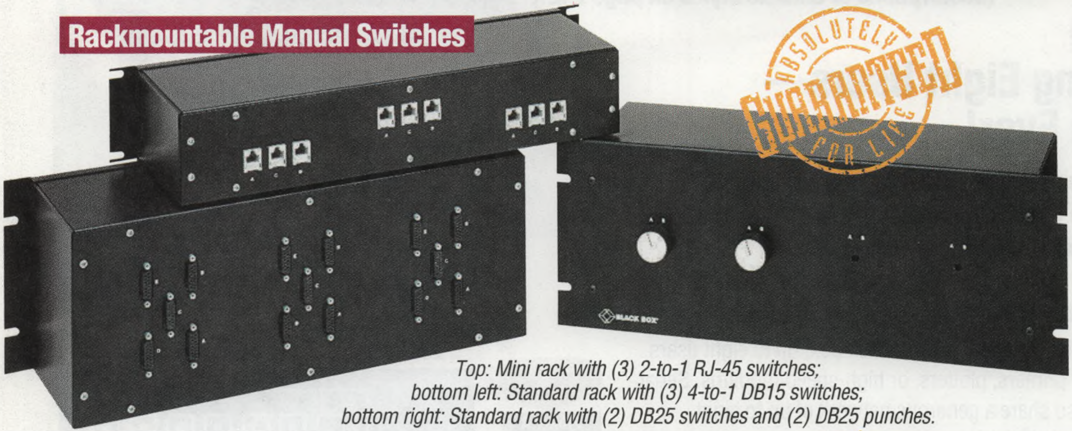
BNC and TNC

Item	Chassis Style	Code	Price
WANG Compatible Switches			
ABC (2 to 1)	B	SW600A	**$122.00**
X (2 to 2)	B	SW620A	**$143.00**
remember to order cables Dual WANG Compatible Cable, PVC *(WANG Part # 120-2300-x)*		EVNCDC	**$15.95 + $.49/ft.**

Electronic
ServSwitches
Keyboard/Video

Assemble a Switch Rack *Customized*

Rackmountable Manual Switches



Top: Mini rack with (3) 2-to-1 RJ-45 switches;
bottom left: Standard rack with (3) 4-to-1 DB15 switches;
bottom right: Standard rack with (2) DB25 switches and (2) DB25 punches.

Rackmountable Switches are ideal when space is tight and you need to consolidate multiple switches. Each Rackmountable Switch is custom-built to your specifications. Pick the switches you need, and we'll install them in the 19-inch rackmountable chassis that best fits your application.

If you order fewer switches than the maximum number the chassis will hold, you can specify additional punchouts for future expansion—free!

Female connectors are standard on each switch except the ABC Bus Switch (SR430). You can specify male connectors for an additional charge per connector.

RACKMOUNT CHASSIS SIZES

Standard (SR000A):
7"H x 19"W x 5.9"D (17.8 x 48.3 x 15 cm)

Mini (SR001A):
3.5"H x 19"W x 5.9"D (8.9 x 48.3 x 15 cm)

PLUS! Standalone Switches, **see pp. 242–247.**

Item	**Code**	**Price**
Rackmountable Chassis		
Standard	SR000A	**$115.00**
Mini	SR001A	**$95.00**

Choose the Switches You Need from These Charts...

Switch	Code	For More Info.	Max. No. per Chassis Std.	Max. No. per Chassis Mini	Price	Free Punches Code
DB25 SWITCHES						
ABC-DB25 (25 leads)	SR025	**p. 243**	8	3	**$87.00**	SRP025
ABC-DB25 (12 leads)	SR088	**p. 243**	8	3	**$69.00**	SRP025
ABC-DB25 (4 leads)	SR084	**p. 243**	8	3	**$59.00**	SRP025
ABC-DB25 Lock-Up	SR020	**p. 243**	8	3	**$127.00**	SRP020
ABC-DB25 Monitor	SR015	**p. 243**	8	3	**$131.00**	SRP015
ABCDE-DB25 (25 leads)	SR026	**p. 243**	5	2	**$144.00**	SRP026
ABCDE-DB25 (12 leads)	SR058	**p. 243**	5	2	**$128.00**	SRP026
ABCDE-DB25 (4 leads)	SR054	**p. 243**	5	2	**$102.00**	SRP026
X-DB25 (25 leads)	SR027	**p. 243**	6	3	**$134.00**	SRP027
X-DB25 (12 leads)	SR100	**p. 243**	6	3	**$111.00**	SRP100
6-to-1 DB25	SR090	**p. 243**	4	1	**$154.00**	SRP090
MODEM & TELCO SWITCHES						
ABC-Telco*	SR870	**p. 244**	6	1	**$189.00**	SRP870
ABC-RJ-11	SR036	**p. 244**	8	3	**$66.00**	SRP036
ABCDE-RJ-11	SR037	**p. 244**	8	2	**$87.00**	SRP037
X-RJ-11	SR038	—	8	3	**$76.00**	SRP038
6-to-1 RJ-11	SR076	**p. 244**	4	2	**$98.00**	SRP076
ABC-RJ-45	SR060	**p. 244**	8	3	**$87.00**	SRP060
6-to-1 RJ-45	SR077	**p. 244**	5	2	**$118.00**	SRP077
ABC-Utility	SR800	**p. 244**	8	3	**$76.00**	SRP800
ABCDE-Utility	SR810	**p. 244**	5	2	**$117.00**	SRP810
6-to-1 Utility	SR830	**p. 244**	4	1	**$129.00**	SRP830

Switch	Code	For More Info.	Max. No. per Chassis Std.	Max. No. per Chassis Mini	Price	Free Punches Code
OTHER D-SERIES SWITCHES						
ABC-DB9	SR030	**p. 243**	8	3	**$70.00**	SRP030
ABCDE-DB9	SR031	**p. 243**	5	2	**$107.00**	SRP031
X-DB9	SR033	**p. 243**	6	3	**$103.00**	SRP033
6-to-1 DB9	SR035	**p. 243**	5	2	**$129.00**	SRP035
ABC-DB15	SR040	**p. 243**	8	3	**$82.00**	SRP040
ABCDE-DB15	SR041	**p. 243**	5	2	**$128.00**	SRP041
X-DB15	SR043	**p. 243**	6	3	**$117.00**	SRP043
ABC-DB37	SR350	**p. 243**	6	2	**$148.00**	SRP350
ABCDE-DB37*	SR360	**p. 243**	4	1	**$179.00**	SRP360
ABC-DB50*	SR400	**p. 243**	6	1	**$169.00**	SRP400
ABCDE-DB50*	SR410	—	4	1	**$210.00**	SRP410
SPECIAL-APPLICATION SWITCHES						
RGBS Video	SR575	**p. 292**	4	2	**$164.00**	SRP575
ABC Bus*	SR430	**p. 246**	4	1	**$210.00**	SRP430

NOTE: For full specifications, refer to the standalone versions of these switches on the page under "For More Info."

* *Specify pinning for switches marked. For pinning specifications, see the pinning diagrams in the Technical Support Services section. See* ***page 623.***

Preassembled Rackmountable Switches

...or Order a Ready-Made, In-Stock

Save Time! Order Our Preassembled Rackmountable Switches.

We have these four Rackmountable Chassis already loaded in the most popular configurations you've requested.

Four Preassembled Configurations:

1. **with Eight 12-Lead ABC Switches.**
   The ABC Switch enables two users to share one printer or other peripheral. Or one user can access two peripherals. See **page 243**.
2. **with Eight 25-Lead ABC Switches.**
   This Rackmount Chassis is the same as the one above but has 25-lead Switches. See **page 243**.
3. **with Five ABCDE Switches.**
   The ABCDE Switch, with 25 leads, works just as our ABC Switch does but enables four users to share one peripheral, or gives one user access to four peripherals. See **page 243**.
4. **with 12 ABC-Coax Switches.**
   The ABC-Coax Switch enables a single user at a terminal to switch between two IBM® 3274 controllers. See **page 246**.

to Your Exact Application...

Black Box Explains...

How to Order Customized Manual Switches.

step 1 Pick the Switches for Your Application.

Be sure to select Switches with connectors that match your cables and equipment, the correct pinning, and the number of switch positions you need. (Remember that an ABC switch has just two positions, not three.) You can mix several types of switches in the same chassis. Call Technical Support to find out the maximum number of switches you can install in each chassis.

step 2 Choose Standard or Mini Chassis.

Our Standard Rackmount Chassis fits a standard rack. It holds up to eight switch modules, depending on switch size. The charts **below** show how many switches of each type go in each Rackmount Chassis. To mix switches in a Rackmount Chassis, call Tech Support.

Our Mini Rackmount Chassis takes only 3.5 inches (8.9 cm) of vertical space. It generally holds either three ABC or two ABCDE switches.

step 3 Specify Connector Punchouts.

If there's space left over in your Rackmount Switch Chassis, remember to plan for future expansion by specifying punchouts—extra holes for additional switches. If you want to add switches to the Rackmount Chassis at any time in the future, you'll need to specify the punchouts when you order.

The Free Punches codes are in the last column of the charts.

For Example:

3 ABC-DB25 Switches $87 x 3 =	**$261.00**
Rackmount Chassis (Standard)	**$115.00**
5 Punchouts (SRP025)	**Free**
Total	**$376.00**

remember to order cables

Find All the Cables You Need on **pp. 64–145.**

Switch	Code	For More Info.	Max. No. per Chassis Std.	Max. No. per Chassis Mini	Price	Free Punches Code
PARALLEL INTERFACE SWITCHES						
ABC-M/50*	SR460	—	6	1	**$225.00**	SRP460
ABCDE-M/50*	SR470	**p. 246**	4	1	**$265.00**	SRP470
ABC Centronics®	SR250	**p. 243**	6	2	**$138.00**	SRP250
ABCDE Centronics	SR260	**p. 243**	5	1	**$179.00**	SRP260
3-to-2 Centronics	SR275	—	5	1	**$185.00**	SRP275
COAX/TWINAX SWITCHES						
ABC-Coax	SR550	**p. 246**	12	3	**$56.00**	SRP550
ABCDE-Coax	SR560	**p. 246**	8	2	**$92.00**	SRP560X
Coax	SR570	**p. 246**	8	3	**$81.00**	SRP570
6-to-1 Coax	SR580	**p. 246**	6	2	**$103.00**	SRP580
ABC-Dual Coax	SR630	**p. 246**	8	2	**$87.00**	SRP630
ABC WANG® Compatible	SR600	**p. 247**	8	3	**$107.00**	SRP600
ABCDE WANG Compatible	SR610	—	4	2	**$158.00**	SRP610X
WANG Compatible	SR620	**p. 247**	6	3	**$128.00**	SRP620
6-to-1 WANG Compatible	SR640	—	4	2	**$170.00**	SRP640
ABC-Twinax	SR650	**p. 247**	8	3	**$62.00**	SRP650
ABCDE-Twinax	SR665	**p. 247**	6	2	**$102.00**	SRP665
3-to-2 Twinax	SR676	—	8	2	**$275.00**	SRP676

Switch	Code	For More Info.	Max. No. per Chassis Std.	Max. No. per Chassis Mini	Price	Free Punches Code
ABC DUAL SWITCHES						
DB25 and RJ-11	SR180	**p. 246**	5	1	**$149.00**	SRP180
DB25 and RJ-45	SR182	**p. 246**	5	1	**$149.00**	SRP182
DB25 and DB25 (RS-232)	SR184	**p. 246**	4	1	**$149.00**	SRP184
DB25 and DB25 (IBM PC)	SR186	**p. 246**	4	1	**$149.00**	SRP186
DB25 and 4-wire	SR188	**p. 246**	5	1	**$149.00**	SRP188
IEEE-488, V.35, & ETHERNET SWITCHES						
ABC-488	SR300	**p. 245**	8	3	**$148.00**	SRP300
ABCDE-488	SR310	**p. 245**	5	2	**$220.00**	SRP310
X-488	SR320	**p. 245**	6	2	**$200.00**	SRP320
3-to-2 (IEEE-488)	SR315	—	6	2	**$185.00**	SRP315
ABC-V.35	SR751	**p. 245**	6	3	**$164.00**	SRP751
ABCDE-V.35	SR752	**p. 245**	5	2	**$235.00**	SRP752
X-V.35	SR753	**p. 245**	4	3	**$220.00**	SRP753
3-to-2 (V.35)	SR775	—	5	2	**$185.00**	SRP775
ABC-Ethernet	SR045	**p. 245**	8	3	**$93.00**	SRP045
ABCDE-Ethernet	SR046	**p. 245**	5	2	**$139.00**	SRP046
X-Ethernet	SR047	—	8	3	**$129.00**	SRP047

For More Information or to Specify Pinning, Call the Experts: 412-746-5500.

Rackmountable-Chassis Switch.

Durability guaranteed.

All BLACK BOX® Switches are tested and certified in our Test Lab, and backed with our lifetime guarantee.

We ship from stock, immediately! Our shelves are stocked with each of the four configurations.

PREBUILT SWITCH SIZE

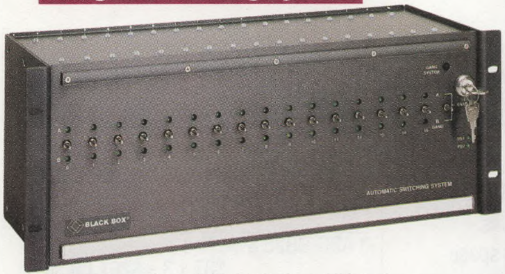
7"H x 19"W x 5.9"D (17.8 x 48.3 x 15 cm)

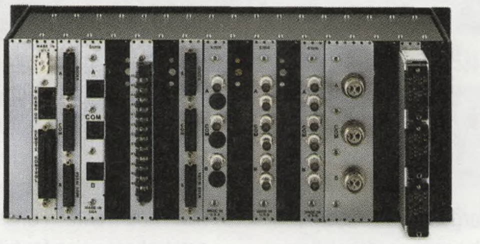
Item	Code	Price
Preassembled Rackmountable Switches		
ABC-25 (8 Switches) All Female		
12-Lead	SM088A-FFF	**$655.00**
25-Lead	SM025A-FFF	**$795.00**
ABCDE-25 (5 Switches) All Female		
25-Lead	SM026A-FFFFF	**$820.00**
ABC-Coax (12 Switches)		
All BNC Female	SM550A-BNC	**$770.00**

ABSOLUTELY
GUARANTEED
FOR LIFE
BLACK BOX

Ganged Switching System

Full Gang-Switching with Local or Remote Control—up to 1024 Ports!





Above: front view; right: back view. All interfaces are shown to illustrate the system's flexibility.

Switch instantly from an online system to a fallback system.

The BLACK BOX® Ganged Switching System gives you full gang-switching control—without the expense of a fully automated network management system.

You have interface flexibility.

Each rack holds up to 16 interface Rack Cards of your choice. With our large selection of Cards, you can change systems easily. Just pop in a new Card—that's all. Mix and match the Cards in any variety you need.

Hot-swappable for easy configuration.

The Ganged Switching System is designed for easy setup. The Rack Cards plug right into the back of the chassis. There are no wires to disconnect. You don't have to power down to make changes to the system. Gang-switching of more than one rack requires a Power Supply Card + Sys Gang (SM514-C).

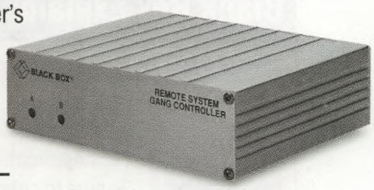
Gang-switch up to 1024 Switch Rack Cards.

If 16 cards aren't enough, daisychain up to 64 Gang Racks. That's 1024 Cards under the control of one master switch!

Or switch Cards independently—from up to 2000 feet away.

Use the BLACK BOX® Remote Control Panel (SM516A) to gang-switch all the Rack Cards from up to 2000 feet (609 m) away. Or flip the toggle switches and independently switch any Card in the first connected chassis of the daisychain. And the Remote Controller's key-switching operation ensures security.

Remote Control Panel (SM516A)



Remote System Gang Controller (SM517A)

Gang-switch from anywhere—via modem.

With the Remote System Gang Controller (SM517A), you can gang-switch from anywhere. All you need is a modem and a PC or terminal.

Ideal for maintenance.

The BLACK BOX® Ganged Switching System is ideal for maintenance applications. When ports on your primary system need attention, just switch over to alternate lines.

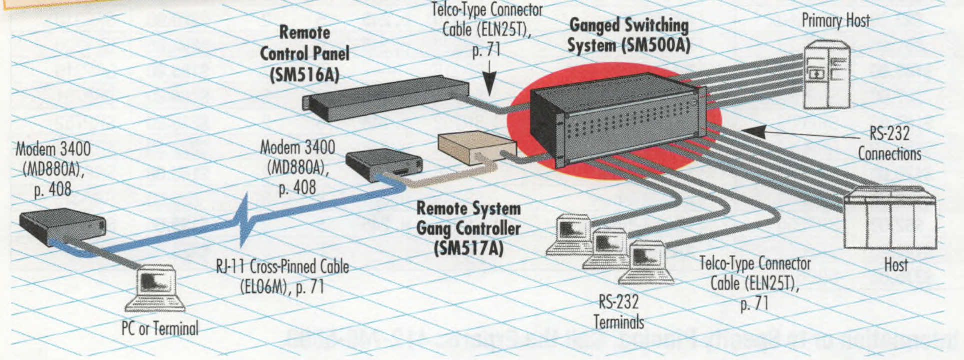
For DEC, HP, or IBM....

For DEC™, HP®, or IBM®, use the AB-RS-232 11 or the AB-RS-232 23 Conductor Card. Both feature Pins 1 and 7 tied common and unswitched.

FAXBACK INFORMATION
Request Document Number: 16476
Call 412-746-5500 Anytime

Item	Code	Price
Order the Rack Chassis and a Power Supply Card...		
Automatic Rack Chassis	SM500A	**$465.00**
Power Supply Card + Sys Gang *(must be installed in master rack of a daisychain)*		
Expandable	SM514-C	**$315.00**
For single-rack systems or slave racks in a chain	SM515-C	**$215.00**
Blank Panel for SM500A	SM518	**$11.00**
...then order the Rack Cards you need:		
Conductor Cards		
AB-V.35 18 leads	SM501-C	**$320.00**
AB-RS-232 11 leads	SM502-C	**$169.00**
AB-RS-232 23 leads	SM503-C	**$195.00**
AB Coax BNC Card	SM504-C	**$169.00**
AB Twinaxial Card (takes two rack slots)	SM505-C	**$259.00**
AB BNC/TNC Card for WANG®	SM506-C	**$195.00**
AB Double Coax Card	SM507-C	**$195.00**
AB RJ-11 Card (4-wire)	SM508-C	**$164.00**
AB RJ-45 Card (8-wire)	SM509-C	**$169.00**
AB Utility Card (4-wire)	SM510-C	**$169.00**
AB DB9 Card	SM511-C	**$195.00**
AB DB15 Card	SM512-C	**$195.00**
If you wish to switch from up to 2000 feet (609 m) away or switch Cards independently, order the...		
Remote Control Panel	SM516A	**$730.00**
remember to order cables ***...and the:***		
Cable for Remote Panel	ELN25T-0005-MM	**$19.95**
		See page 71.
To switch from an off-site location, order the...		
Remote System Gang Controller	SM517A	**$689.00**
...and a pair of modems:		
Modem 3400 (**p. 408**)	MD880A	**$895.00**

> ***"We needed a switching system that could grow with us. We found it with the Ganged Switching System."***


Remote Control Panel (SM516A)
Telco-Type Connector Cable (ELN25T), p. 71
Ganged Switching System (SM500A)
Primary Host
RS-232 Connections
Modem 3400 (MD880A), p. 408
Modem 3400 (MD880A), p. 408
Remote System Gang Controller (SM517A)
RJ-11 Cross-Pinned Cable (EL06M), p. 71
PC or Terminal
RS-232 Terminals
Telco-Type Connector Cable (ELN25T), p. 71
Host

SPECIFICATIONS

Rack Chassis:

Relay Specifications — Latching type: Contacts made of gold cadmium silver;
Initial contact resistance, 50 mohms

CE Approval — Available (SM500A-E, 230-VAC version)

Interface — Digital: RS-232/V.24, V.35, X.21/X.25, T1/T2;
Analog: V.F. (terminal strip), RJ-11, RJ-45;
Coax: BNC, TNC, twinaxial

Power — 115 VAC, 60 Hz (230-VAC, 50-Hz version on request)

Size — 7"H x 19"W x 6.5"D (17.8 x 48.3 x 16.5 cm)

Weight — 12 lb. (5.4 kg), fully populated

Remote Control Panel:

CE Approval — SM501-C–SM515-C

Connectors — (1) 50-pin telco female

Size — 1.8"H x 19"W x 6.5"D (4.6 x 48.3 x 16.5 cm)

Weight — 7 lb. (3.2 kg)

Remote System Gang Controller:

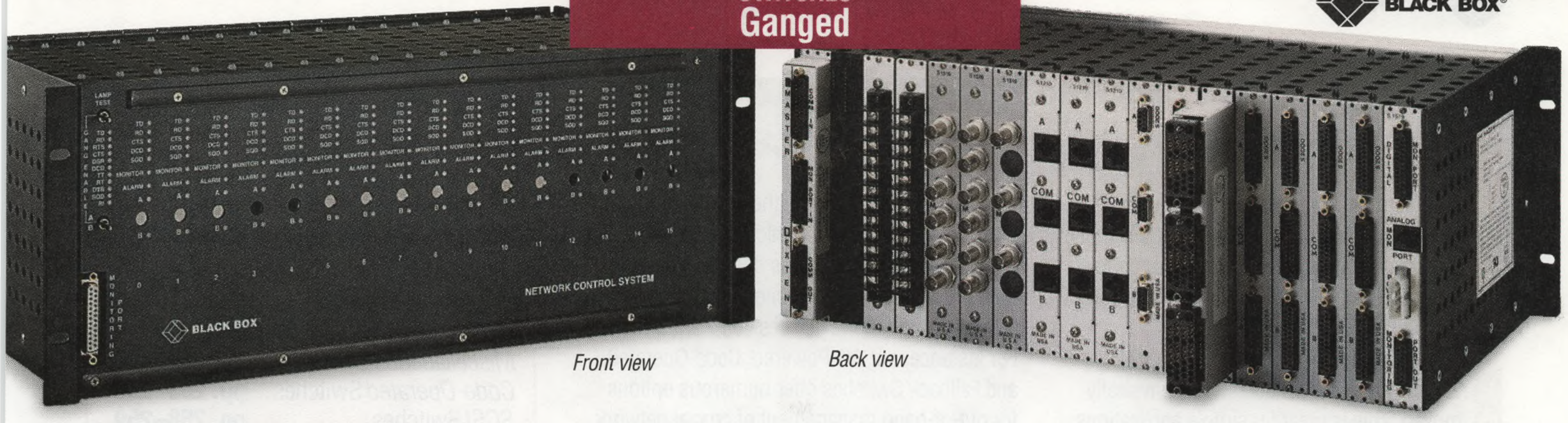
Connectors — (1) DB25 female, (1) RJ-11 female

Size — 2.3"H x 5"W x 5"D (5.8 x 12.7 x 12.7 cm)

Weight — 1 lb. (0.5 kg)

remember to order cables
All the Cables You Need, see pp. 64–145.

In This Section...
Manual
Ganged



Front view *Back view*

Network Switching System

Just Program the Schedules...

The Network Switching System Takes Care of the Rest Automatically—Even When You're Not There!

Program automatic switching.

The BLACK BOX® Network Switching System (NSS) is a modular, electronically governed switching system that gives you powerful control over your network switching.

With its programmable switching control, you can set your NSS to switch at designated times or on any day throughout the year. Late-night, weekend, and holiday switching are no longer a problem. Instead of handling these off-hour operations yourself, or paying someone else to do it, just program the NSS.

Gang-switch 1024 lines.

When you daisychain NSS units, you can gang-switch as many as 1024 lines—right from your PC or terminal.

Switch individual lines.

Get pinpoint control over each device in your network, too. Single out one line, program special groups, or switch all the connected devices at the same time. To switch, just send a command from your PC or terminal, or flip a switch on the NSS itself.

Switch individual Cards.

Just flip the toggle switches and switch any card *independently.*

Instant fallback protection.

Use the NSS for instant protection from line failures. If a primary line goes down, you can switch to your backup line in seconds. Or program it in advance to switch lines when, for example, you're expecting scheduled maintenance.

Synchronize lines.

Choose from two switching actions. Pick conventional A/B switching when you have all the main lines hooked up to "*A*" and all the backup devices to "*B.*"

But if some main lines are hooked up to "*B,*" toggle-switching easily sets things right. You can switch individual lines to their opposites. So you can keep your main lines and backup lines straight without reconnecting any cables.

Hot-swappable for easy configuration.

The Network Switching System is designed for easy setup. The interface Cards plug right into the NSS's back. There are no wires to disconnect. You don't have to power-down to make changes to the system.

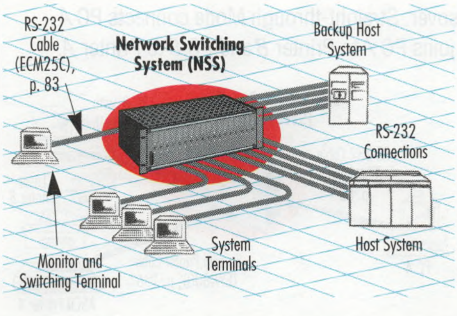
Compatible with multiple interfaces.

The Network Switching System is compatible with all the equipment on your network. Our selection of Cards is so wide—RS-232, V.35, coax, twinax, and more—that you can connect virtually any device to the NSS.

Alarm and Monitor option.

When set for PC operation, our NSS Cards with monitoring and alarm capability scan your RS-232 and V.35 lines. So you get fast response to problems anywhere on your network. It flashes an alarm on your screen the second your line goes down.

The Network Switching System fits easily into a 19-inch equipment rack.


RS-232 Cable (ECM25C), p. 83
Network Switching System (NSS)
Backup Host System
RS-232 Connections
Host System
System Terminals
Monitor and Switching Terminal

FAXBACK INFORMATION
Request Document Number: 16483
Call 412-746-5500 Anytime

SPECIFICATIONS

Operating Temperature — 32 to 122°F (0 to 50°C)

Speed — For terminal-to-switch communications: 300-9600 bps; For Cards: As specified by the interface

CE Approval — SM601C–SM621C; Chassis available (SM600AE, 230-VAC version)

Interface — Terminal to Switch: RS-232; Available with Cards: RS-232/V.24, V.35, Coax BNC, Twinax, WANG compatible, RJ-11, RJ-45, Voice-frequency terminal strip

Power — 115 VAC, 60 Hz (230-VAC, 50-Hz version on request)

Size — Chassis: 7"H x 19"W x 8"D (17.8 x 48.3 x 20.3 cm)

Weight — Chassis: 9.1 lb. (4.1 kg); Power Supply Card: 1 lb. (0.5 kg); Redundant Power Supply: 39.2 lb. (17.8 kg)

Item	Code	Price
Order the Network Control Switching Chassis (a Power Supply Card is included)...		
Network Control Switching System Chassis	SM600A	**$975.00**
Power Supply Card (spare)	SM621C	**$215.00**
...next, order the Master Control Card...		
Master Control Card with Monitor Port	SM617C	**$705.00**
...then order the Rack Cards you need:		
AB-232 12-Conductor Card	SM603C	**$179.00**
with Alarm and Monitor	SM604C	**$245.00**
AB-232 24-Conductor Card	SM605C	**$210.00**
with Alarm and Monitor	SM606C	**$285.00**
AB V.35 18-Conductor Cards	SM601C	**$359.00**
with Alarm and Monitor	SM602C	**$430.00**
X-232 24-Conductor Card	SM607C	**$365.00**
AB Coax BNC Card	SM608C	**$179.00**
AB Twinaxial Card (2-slot)	SM609C	**$259.00**
AB WANG® Compatible BNC/TNC Card	SM610C	**$205.00**
AB Double Coax Card	SM611C	**$205.00**
AB RJ-11 (4-wire) Card	SM612C	**$175.00**
AB RJ-45 (8-wire) Card	SM613C	**$179.00**
AB V.F 4-Conductor Terminal Strip	SM614C	**$179.00**
AB DB9 Card	SM615C	**$215.00**
AB DB15 (T-1) Card	SM616C	**$215.00**
Extension Control Card with Monitor Port	SM618C	**$640.00**
Blank Panel	SM518	**$11.00**

▷ Electronic ▷ ServSwitches ▷ Keyboard/Video

Electronic Switches—for Advanced Applications.

Electronic Switches are the solution for a wide range of applications—especially those that demand an advanced degree of control. But what's the difference between a Manual and an Electronic Switch?

When you turn the dial of a Manual Switch, internal connections are physically moved. This is great for simple applications, but a Manual Switch can cause voltage spikes that can damage particularly sensitive equipment like laser printers.

Electronic Switches do their switching with solid-state components, which open a wider range of applications. Switching is done by computer, modem, or even a touch-tone phone. You can get remote control of the devices you want switched. For instance, our AC-Powered, Code-Operated, and Fallback Switches offer numerous options for out-of-band management of crucial network resources. They give you the control you need for high-end applications and sensitive equipment.

If you have any questions about Electronic Switches, call Tech Support at **412-746-5500**.

Here's where you'll find:

Miscellaneous Switches .....**pp. 252, 257**
Code-Operated Switches ....**pp. 253–256**
SCSI Switches....................**pp. 258–259**
Security Switches ....**p. 260**
Out-Of-Band Management Switches
....**pp. 262–267**
Fallback Switches ....**p. 268**

Local/Remote Electronic Switch

The Simple, *Inexpensive* Alternative to a Code-Operated Switch.

BLACK BOX
2 TO 1 LOCAL/REMOTE SWITCH
REMOTE
A
B
PWR
SERIAL
PARALLEL
C

- **Electronic switching for all your needs—and it's safe for your LaserJet® printer.**
- **Choose your remote access port: RS-232, RS-422, RS-485, RS-530, TTL, or dry contacts.**

The Local/Remote Electronic Switch works electronically, locally, and remotely, with a number of interfaces and with a wide range of input voltages.

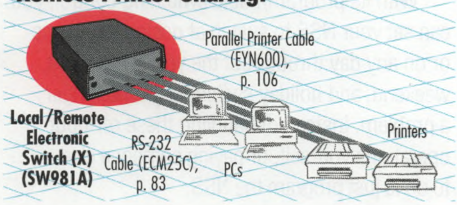
It's smarter than a manual switch because it can switch remotely through EIA or TTL control signals. Or, you can switch locally by turning the knob.

SPECIFICATIONS

Leads Supported — DB25: 1–25
Signal Level — 15 volts maximum
CE Approval — 230-VAC versions: SW980AE–SW982AE
Interface — RS-232, TTL, Centronics®, RS-530, V.35, analog, and more
Connectors — (3), (4), or (5) DB25 female, on rear panel; (1) RJ-45, (1) 4-screw terminal
Indicators — (1) Switch position
Power — 115/230 VAC, 60/50 Hz
Size — 3.5"H x 6"W x 6.3"D (8.9 x 15.2 x 16 cm)
Weight — 2 lb. (0.9 kg)

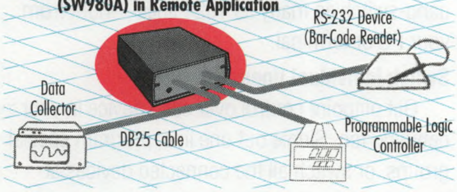
Item	Code	Price
Local/Remote Electronic Switch		
ABC (2 to 1)	SW980A	**$200.00**
ABCDE (4 to 1)	SW982A	**$235.00**
X (2 to 2)	SW981A	**$260.00**
remember to order **cables** RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
	For other lengths, see p. 83.	
RJ-45 (8-Wire) Modular Cable, 7-ft. (2.1-m) Straight-pinned	EL08MS-07	**$4.95**
For other lengths and pinnings, see p. 71.		

Remote Printer-Sharing.


Parallel Printer Cable (EYN600), p. 106
Local/Remote Electronic Switch (X) (SW981A)
RS-232 Cable (ECM25C), p. 83
PCs
Printers

Ideal for Industrial Applications, Too!

Local/Remote Electronic Switch 2 to 1 (SW980A) in Remote Application


RS-232 Device (Bar-Code Reader)
Data Collector
DB25 Cable
Programmable Logic Controller

Electronic X-Switch

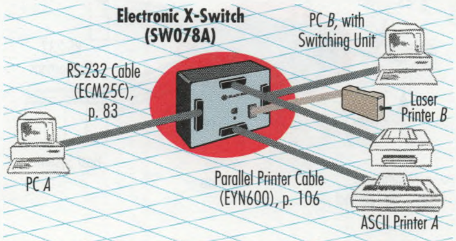
Electronic Switching between Your ASCII Printer and a Laser Printer.

- **Two PCs can switch between a laser printer or an ASCII printer.**
- **Electronic switching keeps laser printers safe!**

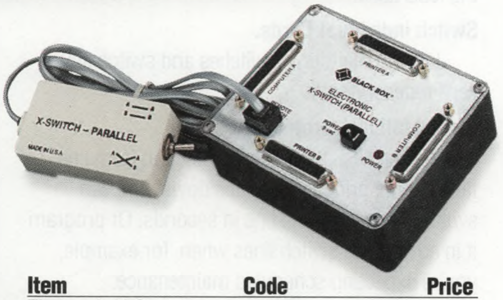
Two modes are available: straight-through or crossover. Straight-through Mode connects PC *A* to Printer *A* and PC *B* to Printer *B*. Crossover position joins PC *A* to Printer *B* and PC *B* to Printer *A*.

SPECIFICATIONS

Flow Control — Hardware handshaking
Leads Supported — Serial: 2–6, 8, 20, 22 switched, 1 and 7 tied common
Remote Switch — 2-Position toggle switch with 7-ft. (2.1-m) RJ-11 power cord
CE Approval — 230-VAC version: SW079AE
Interface — Parallel: IBM parallel; Serial: RS-232
Connectors — Parallel: (4) DB25 female; Serial: (2) DB25 female, (2) DB25 male
Indicators — (1) Power on each model
Power — 9 VAC @ 300 mA
Size — 4"H x 6"W x 2"D (10.2 x 15.2 x 5.1 cm)
Weight — 1.2 lb. (0.5 kg)


Electronic X-Switch (SW078A)
PC B, with Switching Unit
RS-232 Cable (ECM25C), p. 83
Laser Printer B
PC A
Parallel Printer Cable (EYN600), p. 106
ASCII Printer A

FAXBACK INFORMATION
Request Document Number: 11165
Call 412-746-5500 Anytime


X-SWITCH – PARALLEL
MADE IN U.S.A.
BLACK BOX
ELECTRONIC X-SWITCH (PARALLEL)
PRINTER A
PRINTER B
POWER

Item	Code	Price
Electronic X-Switch		
Parallel	SW078A	**$200.00**
Serial	SW079A	**$200.00**
remember to order **cables** RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010-MM	**$23.95**
	For other lengths and genders, see p. 83.	
Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**
For other lengths and genders, see p. 106.		

Black Box Explains...

Code-Operated and Matrix Switches.

BLACK BOX® Code-Operated and Matrix Switches give you computer-controlled switching in a variety of applications.

Code-Operated Switches

BLACK BOX® Code-Operated Switches enable one device to control up to 64 connected devices. For instance, you can use one modem—not eight—to control eight devices. Code-Operated Switches are ideal for any applications that require remote switching for file-sharing or monitoring.

Use Code-Operated Switches for:

- Remote Programming. Call in via remote sites to access servers, logic controllers, or any devices that require programming.
- Diagnostics. From your master control room, you can probe servers and run diagnostics.

Matrix Switches

Matrix Switches enable more than one device to control other devices. Any port can connect to any port and perform more than one operation at a time independently. The Code-Operated Switches only talk to one slave port at a time.

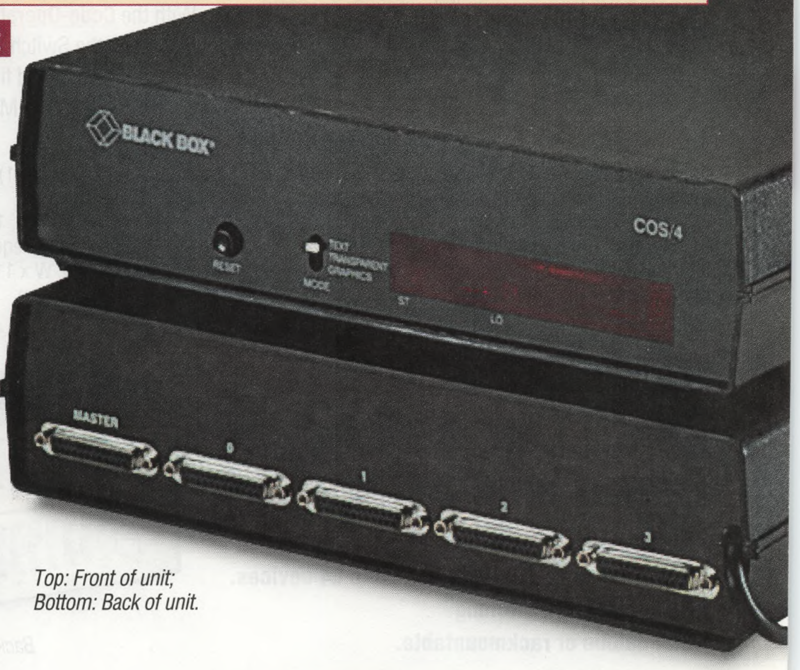
For instance, if your operation has four computers that need to share two printers and one modem, a Matrix Switch is what you need to handle the job. Use Matrix Switches for:

- Industrial Applications. You can download instructions remotely to more than one programmable logic controller.
- Data Sharing. PCs or industrial devices can be connected—locally or remotely—to other PCs and industrial devices or for file swapping.

Code-Operated Switch (RS-232 & RS-422) 4-Port and 8-Port

Control up to *Eight* Serial Devices—RS-232 or RS-422—from Your PC.

- **Keeps your connection safe—once a connection is made, other ports are locked out.**
- **DTE/DCE-selectable, so you can switch between a modem and a printer.**
- **Includes a hardware-handshake lead in each direction for added control.**
- **Safe for use with laser printers.**



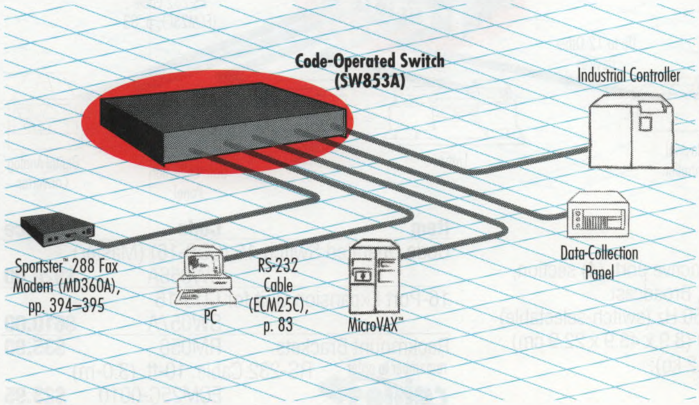
Top: Front of unit;
Bottom: Back of unit.

The BLACK BOX® Code-Operated Switch (RS-232 & RS-422) enables you to switch your serial devices with codes.

There's no unintended triggering, either—no matter what data you're sending. With an internal DIP switch, *you* select the arming character to use as a trigger.

You can set each port individually as DTE or DCE. That's handy for switching among modems and printers. And your connection is secure. Once a connection is made, other ports are locked out until transmission is done or the timeout period expires. Remember that all ports need to be set to operate with identical speeds and word structures.

For extra control, there's a hardware-handshake lead in each direction in case a device (or the computer) needs it.



SPECIFICATIONS

Data Format — 5 to 8 bits
Speed — 75 bps to 19.2 Kbps
Switches — Text/Transparent/Graphics Mode; Reset
CE Approval — All items listed are approved
Interface — RS-232/RS-422 async
Connectors — SW853A, SW421A: (5) DB25 female; SW854A, SW422A: (9) DB25 female; DCE/DTE switch-selectable
Indicators — (1) 7-segment channel-selected display; (2) Lockout and Switch Time LEDs
Power — 115/230 VAC, 60/50 Hz, 11 watts (switch-selectable)
Size — 3"H x 12.8"W x 11.3"D (7.6 x 32.5 x 28.7 cm)
Weight — 8 lb. (3.6 kg)

Item	Code	Price
Code-Operated Switch		
RS-232 4-Port	SW853A	**$460.00**
8-Port	SW854A	**$660.00**
RS-422 4-Port	SW421A	**$535.00**
8-Port	SW422A	**$750.00**
remember to order cables RS-232 Cable, 10 ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.

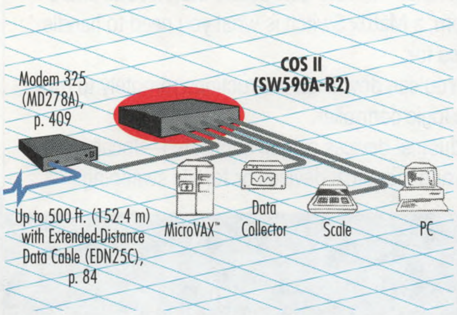
CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!
COS - II
BLACK BOX
RESET
MASTER PORT
PORT 1
PORT 2
PORT 3
PORT 4
PORT 7

Top: back of unit; bottom: front of unit.

Code-Operated Switch II (COS II)

Control up to Nine Serial Devices from Your PC—Any Speed, Any Word Structure.

- **Individual port selection for word size, flow control, speed, parity, and DCE/DTE operation.**
- **8-KB buffer for speed and word-format conversion; buffer downshifts data for slower devices.**
- **Five ports become nine with the 4-Port Expansion Board.**
- **Standalone or rackmountable.**


Modem 325
(MD278A),
p. 409
COS II
(SW590A-R2)
Up to 500 ft. (152.4 m)
with Extended-Distance
Data Cable (EDN25C),
p. 84
MicroVAX™
Data
Collector
Scale
PC

You can mix plotters, laser printers, modems—anything you can attach to your serial port, you can attach to the COS II.

Configure each port independently. You don't have to cripple your whole system just to accommodate one device. Each COS II port has its own bank of DIP switches, so you can exactly match each port to its attached device. The COS II will do the conversion between the two connected ports.

With the **Code-Operated Switch II Ready Pak** you can hook the Switch up the day it arrives. It includes the Switch and five 10-foot RS-232 Cables (ECM25C-0010-MF).

FAXBACK INFORMATION
Request Document Number: 10676
Call 412-746-5500 Anytime

Item	**Code**	**Price**
Code-Operated Switch II (COS II)	SW590A-R2	**$525.00**
Code-Operated Switch II Ready Pak includes: the Switch Plus (**5**) 10-ft. RS-232 Cables	SW590A-R2-CABPAK	**$644.75**
4-Port Expansion Board for COS II	SW591C	**$205.00**
Rackmount Brackets	TL486	**$25.00**
remember to order cables: Extended-Distance Quiet Cable, 10-ft. (3.0-m), Male/Female	EMN25C-0010-MF	**$49.95**

For other lengths and genders, see pp. 84, 108, and 117.

SPECIFICATIONS

Leads Supported — 1, 8, 20, and 22
Switches — Internal DIP switches: Word Format, Speed, DTE/DCE, and Arming Character
CE Approval — All items listed are approved
Interface — RS-232, full-duplex, asynchronous
Connectors — (5) DB25 female
Indicators — (1) Power, (1) Lockout, (8) Port Connected
Power — 115 VAC, 60 Hz, 11 watts (230-VAC version on request)
Size — 2.3"H x 12.2"W x 11"D (5.8 x 31 x 27.9 cm)
Weight — 7.5 lb. (3.4 kg)

◆ ◆ ◆

Code-Operated Switch-16 (COS-16)

Control up to *64* Devices from a Single Computer.

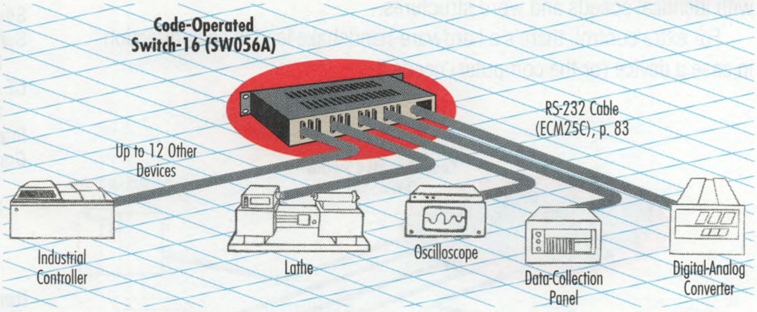
- **All 16 ports are code-operated.**
- **Stack Expansion Units to link up to 64 devices.**
- **No accidental switching.**
- **Standalone or rackmountable.**

BLACK BOX
COS - 16 (MASTER)

Back of unit.

Front of unit.

Bring the ease and convenience of code-operated switching to your manufacturing floor or anywhere else you need multiple-switching power. The Code-Operated Switch-16 (COS-16) uses a special code-repeat feature that separates switch codes and binary data. That means you don't get any accidental switching. The unit will request codes up to eight times before switching. And broadcast modes let you transmit simultaneously to all attached devices. Still need more switching power? Add Expansion Units to control up to 48 more devices! *That's* power.


Code-Operated
Switch-16 (SW056A)
RS-232 Cable
(ECM25C), p. 83
Up to 12 Other
Devices
Industrial
Controller
Lathe
Oscilloscope
Data-Collection
Panel
Digital-Analog
Converter

FAXBACK INFORMATION
Request Document Number: 10425
Call 412-746-5500 Anytime

SPECIFICATIONS

Protocol — Asynchronous
Speed — 300 bps to 19.2 Kbps
CE Approval — All items listed are approved
Interface — Master port: DTE; Expansion ports: DCE
Connectors — (17) DB25 female
Indicators — 26 LEDs: (16) active port, (4) section, TX, RX, RTS, CTS, Power, Broadcast
Power — 115/230 VAC, 60/50 Hz (switch-selectable)
Size — 3.5"H x 17.3"W x 9"D (8.9 x 43.9 x 22.9 cm)
Weight — SW056A: 7 lb. (3.2 kg); SW057A: 4 lb. (1.8 kg)

Item	**Code**	**Price**
Code Operated Switch-16 (COS-16) (Master)	SW056A	**$920.00**
16-Port Expansion Unit for COS-16	SW057A	**$610.00**
Rackmount Brackets	RM056	**$35.90**
remember to order cables: RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.

In This Section...
Manual
Ganged

Serial Code-Operated Switch (SCOS-2)

Use Software Commands to Control *Two* Serial Devices.

BLACK BOX
SCOS-2
MODE 1
DISABLE
MODE 2
SWITCH TIME
MODE

Top: back of unit; bottom: front of unit.

The Serial Code-Operated Switch (SCOS-2) enables you to switch between two serial devices—locally or remotely. Just send a special "trigger" character to the SCOS-2, and it switches ports.

Item	Code	Price
Serial Code-Operated Switch (SCOS-2)	SW281A	**$300.00**
remember to order **cables** RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.

SPECIFICATIONS

Leads Supported — 1–8 and 20

Switches — (1) 3-position toggle switch (Mode 1/Disable/Mode 2);
(1) 3-position slide switch (code-activated, manual Channel A, manual Channel B);
Internal DIP switches: Word Format, Speed, DTE/DCE, and Arming Character

CE Approval — 230-VAC version: SW281AE

Interface — RS-232, full-duplex, asynchronous

Connectors — (3) DB25 female

Power — 115 VAC, 60 Hz, 11 watts (230-VAC version on request)

Size — 2.2"H x 8.2"W x 11.2"D (5.6 x 20.8 x 28.4 cm)

Weight — 2.2 lb. (1 kg)

◆ ◆ ◆

High-Speed Code-Operated Switches

Async

Send Data—*Including Graphics*—at 115.2-Kbps Speeds to Two, Four, or Eight Serial Devices.

- **Switch between up to eight serial devices: printers, PCs, plotters, and more.**
- **Direct data from your master computer to multiple slave peripherals.**
- **Address peripherals individually, or broadcast data to all at once.**
- **Three models support connections to two, four, or eight peripherals.**
- **Zip data along at 115.2-Kbps speeds.**
- **Electronic switching is safe for laser printers.**

You control the traffic flow to multiple peripherals using simple port-selection codes sent from a single master computer. These new High-Speed Code-Operated Switches rifle your data along the path you choose at speeds up to 115.2 Kbps—perfect for souped-up serial ports.

You'll love the new data broadcast feature (ideal for sharing information simultaneously with all attached devices). And the brilliant STATUS LED glows to show which ports are receiving data so you can monitor activity—up 20 feet away!

The two-port model is compact-sized to tuck behind your PC. The four- and eight-port models feature sturdy desktop cases.

SPECIFICATIONS

Diagnostics — Self-test

Leads Supported — Pins 2, 3, 5, 7, 20

Protocol — Asynchronous

Speed — 115.2, 57.6, 38.4, 19.2, 9.6, 2.4, 1.2, or 0.6 Kbps

CE Approval — 230-VAC versions: SW282AE–SW284AE

Interface — Serial DCE on all ports

Connectors — (3), (5), or (9) DB25 female (DTE/DCE selectable)

Indicators — SW282A, SW283A: (2) LEDs: (1) Channel Display, (1) mode; SW284A: (4) LEDs: (2) Mode of operation, (2) Port selected B or C

Power — 115-VAC, 60-Hz wallmount transformer (230-VAC, 50-Hz version on request)

Size — SW282A–SW283A: 2.5"H x 12.5"W x 8.5"D (6.4 x 31.8 x 20.1 cm); SW284A: 1"H x 3.2"W x 5.8"D (2.5 x 8.1 x 14.7 cm)

Weight — SW282A–SW283A: 3.5 lb. (1.6 kg); SW284A: 0.2 lb. (0.1 kg)

POWER
RESET
TX OR TR
MODE
BLACK BOX
HIGH SPEED COS-4
PORT

The four- and eight-port models are sturdy desktop units. The two-port model is compact enough to tuck behind your PC.

FAXBACK INFORMATION
Request Document Number: 14319
Call 412-746-5500 Anytime

Item	Code	Price
High-Speed Code-Operated Switch		
8-Port (COS-8)	SW282A	**$684.00**
4-Port (COS-4)	SW283A	**$522.00**
2-Port (COS-2)	SW284A	**$320.00**
remember to order **cables** PC/XT Serial Printer Cable		**See page 108.**
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.

◆ ◆ ◆

Bar-Code Readers (PC, PS/2, Bus, and Serial Readers)

Boost Speed and Accuracy in Your Point-of-Sale or Inventory-Control Applications.

- **Scan Code 39, UPC-A&E, EAN-8, EAN-13, Codabar, and more.**

Now you can scan compressed, expanded, even multiple codes without changing software. Just install the software, then wave the stainless steel pen over the codes on the configuration menu.

The PC and the PS/2® Readers go between your keyboard and CPU with the included Y cable. The Bus Reader fits in the short slot of any IBM PC compatible. The Serial Bar-Code Reader works with any terminal, PC, or minicomputer that has an RS-232 serial port.

Create your own bar codes. Utility I supports multiple bar-code types, including Interleaved 2 or 5, Codabar, UPC-A (12-digit format), EAN-8, EAN-12, full ASCII Code 39, and Code 39. LabelRIGHT™ displays bar codes on screen exactly as they'll print. It supports all the features of an HP® LaserJet® Series III printer.

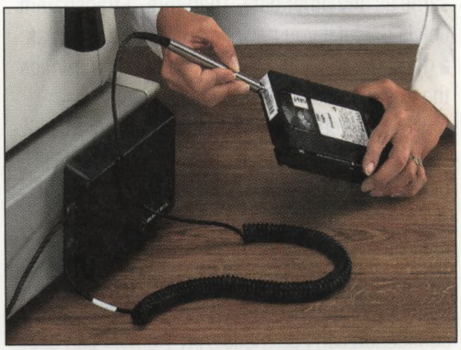
SPECIFICATIONS

CE Approval — All items listed are approved

Interface — PC Reader: IBM PC compatible 5-pin DIN;
PS/2 Reader: IBM PS/2 6-pin mini DIN;
Bus Reader: IBM PC or compatible internal bus;
Serial Bar-Code Reader: RS-232 with (1) DB25 male, (1) DB25 female

Power — PC, PS/2, and Bus Readers: from the computer;
Serial Bar-Code Reader: 5-VDC, 200-mA max. (power supply included)

Size — PC, PS/2, and Serial Bar-Code Reader: 6.8"H x 5"W x 1.3"D (17.3 x 12.7 x 3.3 cm);
Bus Reader: Half card



Item	Code	Price
PC Reader	DA025	**$565.00**
PS/2 Reader	DA026	**$565.00**
Bus Reader	DA027-C	**$565.00**
Serial Bar-Code Reader	DA030	**$565.00**
Order software for your Serial Bar-Code Reader...		
Utility I 3½"	TC520V	**$129.00**
LabelRIGHT 3½"	TC521V	**$279.00**

Code-Operated Matrix Switch

Centralize Your Switching Chores with the Flexible Any-Port-to-Any-Port Switch.

- **Shows the current status of all ports to any PC user running terminal emulation.**
- **Port-independent selection of speed, flow control, and data format.**
- **No "master" port—any port can talk to any other.**
- **Rackmountable with optional brackets.**

CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!

CODE OPERATED MATRIX SWITCH
STATUS
0 1 2 3 4 5 6 7 8 PWR
BLACK BOX
PORT 0
PORT 1
PORT 2
PORT 3
PORT 4
PORT 5
PORT 6
PORT 7
PORT 8

We can customize this switch for your application! Call Tech Support for more information.

With the BLACK BOX® Code-Operated Matrix Switch, *any* port can select *any* other port. Mix and match PCs and peripherals in *any* combination for maximum flexibility. This flexible switching eliminates the need for a master port. Any of the Switch's ports can communicate with any other port. Also, any two ports can communicate simultaneously. For instance, you can use the Switch to connect two PCs to a printer, a modem, and a host. As one PC sends data to the printer, the other PC can send data to either the modem or the host.

Each port is set independently as DTE or DCE so it's easy to connect a mix of modems, PCs, or other devices. Or you can control a group of industrial devices, like scales or bar-code readers, right from one PC.

Create transparent links between any two ports. In a transparent link, the Code-Operated Matrix Switch treats the attention character the same as any other data. Therefore, a transparent link is useful if you have an application (such as a graphics application) in which the data mimics the attention character.

You can consolidate multiple devices that have RS-232 diagnostic ports by using a PC or by using remote access via modem. See the "MIS Application" diagram **above**.

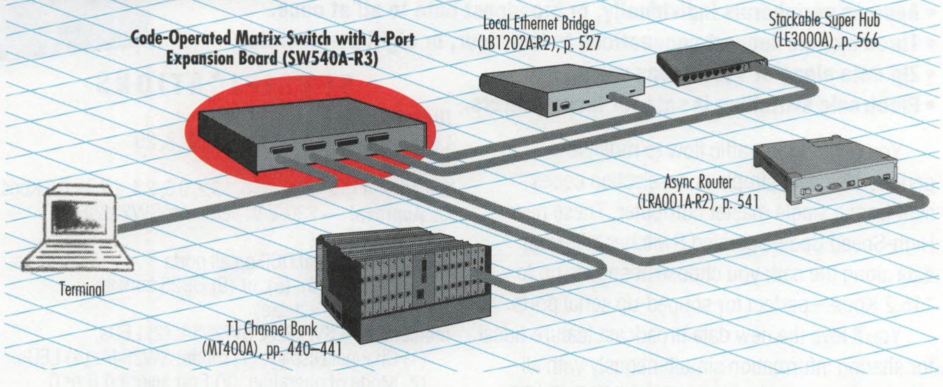
You get full status information. Automatic notification tells you when your connection is made or, if the port you select is busy, that a connection can't be made. Any PC user can get the current status of all ports—instantly find out which ports are linked together, the location of transparent links, system activity, and attention characters.

Shunt jumpers simplify cabling. Use the shunt jumpers to configure each port for either data-terminal or data-communications equipment. No crossover cable is necessary—you need only standard straight-through cabling.

The optional Expansion Board almost doubles the capacity of the Switch, from five to nine ports. And all ports are independent. Speed, flow control, and data format can be set for each port as you wish.

For your convenience we've created the Code-Operated Matrix Switch Ready Pak. It includes five 10-foot RS-232 Cables (ECM25C-0010-MF).

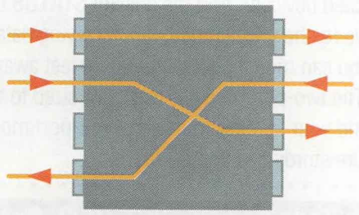
Typical MIS Application


Code-Operated Matrix Switch with 4-Port Expansion Board (SW540A-R3)
Local Ethernet Bridge (LB1202A-R2), p. 527
Stackable Super Hub (LE3000A), p. 566
Async Router (LRA001A-R2), p. 541
Terminal
T1 Channel Bank (MT400A), pp. 440–441

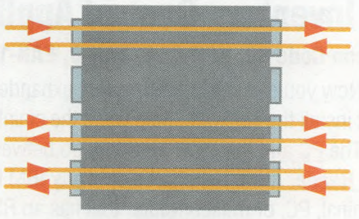
SPECIFICATIONS

Data Format — 5 to 8 bits
Flow Control — Hardware or X-ON/X-OFF
Speed — 110 bps to 19.2 Kbps
CE Approval — SW541-C and 230-VAC versions: SW540AE-R3
Interface — RS-232 asynchronous
Connectors — DB25 female; DCE/DTE strap-selectable
Power — 115 VAC, 60 Hz, 5 watts (230-VAC version on request)
Size — 2.3"H x 12.2"W x 11.1"D (5.8 x 31 x 28.2 cm)
Weight — Switch: 7.7 lb. (3.5 kg); Expansion Board: 0.6 lb. (0.3 kg)

FAXBACK INFORMATION
Request Document Number: 10906
Call 412-746-5500 Anytime



Any port can communicate with any other port in either direction.

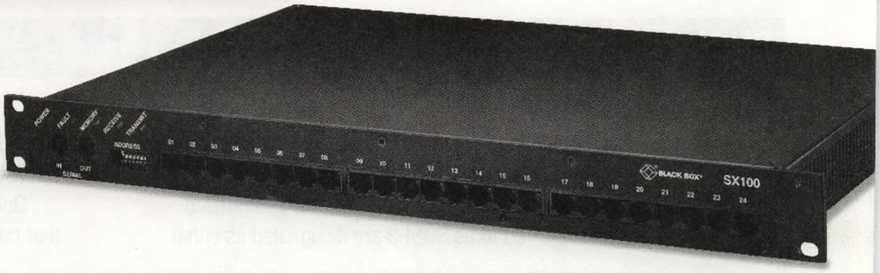


Data can travel through any port in both directions at the same time.

Item	Code	Price
Code-Operated Matrix Switch	SW540A-R3	$550.00
4-Port Expansion Board	SW541-C	$205.00
Code-Operated Matrix Switch Ready Pak includes: The Switch **plus** (5) 10-ft. RS-232 Cables	SW540A-R3-CABPAK	$669.75
Rackmount Brackets	TL486	$25.00

SX100 Electronic Patch Panel

The Powerful Network-Management and Disaster-Recovery Tool.



- **Fail-safe design for disaster recovery.**
- **Local or remote control (by modem).**
- **Protocol-transparent—works in any twisted-pair application.**
- **Wide-area switching right from your PC.**
- **Automated record-keeping.**
- **Windows interface.**
- **Eliminates the need for manual cable patching.**

Power failure. Faulty cabling. Computer viruses. Security breaches. File-server crashes.

Your network is vulnerable! But Black Box has your solution.

Network down? Reconfigure your entire LAN right from your PC—in minutes.

With the BLACK BOX® SX100 Electronic Patch Panel you can deal with your network crises quickly, easily, and confidently. It's a powerful electronic-switching solution that gives you the power to reconfigure your entire twisted-pair LAN/WAN to a backup system—right from your PC. You can have your network back under control in minutes. With the Windows® based software you can easily move, add, delete, or change any device in your logical network—without recabling!

Create automatic backup routines to anticipate different network problems.

Preconfigure your backup options before disaster strikes. You can load up to ten scenarios. Then, when the worst happens, you can use the SX100 to instantly fall back to emergency file servers, connect network analyzers to pinpoint trouble spots, route users to a backup LAN bridge, or change network configurations. The SX100 is controlled through an out-of-band PC connection so you can make changes even when the network is down.

Removable Memory for even more protection.

The SX100 stores your latest system configuration in the Removable Memory Cartridge. So your configuration is always backed up and ready to restore if the system goes down.

Remote operation.

For recovery during off-hours or when a site is unattended, you can operate the SX100 remotely by dialing in from an off-site PC. One manager can monitor many SX100s without having to go on-site.

Complete LAN control whenever you need it.

When the emergency is over, the SX100 is still a powerful network-management tool. You can use it to configure system moves, additions, and changes. And you can do it all sitting at your PC in the comfort of your office—not standing in some inconvenient wiring closet. You can even change WAN connections by modem.

You get complete control of your LAN. The SX100 does all your switching and keeps track of all the information you need.

When a user changes offices, just update the database. Switching takes place internally on the SX100. All software changes are made in the physical network so you always know exactly what the state of your LAN is. You can generate reports on demand. Use easy-to-follow menus for simplified operation. Monitor every detail of network configuration at a glance. See which computer port is connected to which wall outlet, which ports are free, which pairs are free, and which ports are part of a multipoint operation.

Protection for every protocol.

Each SX100 is transparent to signal protocol so you can use it in any twisted-pair application running at up to 16 Mbps, including Token Ring, 10BASE-T Ethernet, AS/400® or IBM® 3270 environments, ARCNET®, AppleTalk®, T1, and more.

This powerful tool for network management and disaster recovery is an investment that will save you time and aggravation—and give you peace of mind.

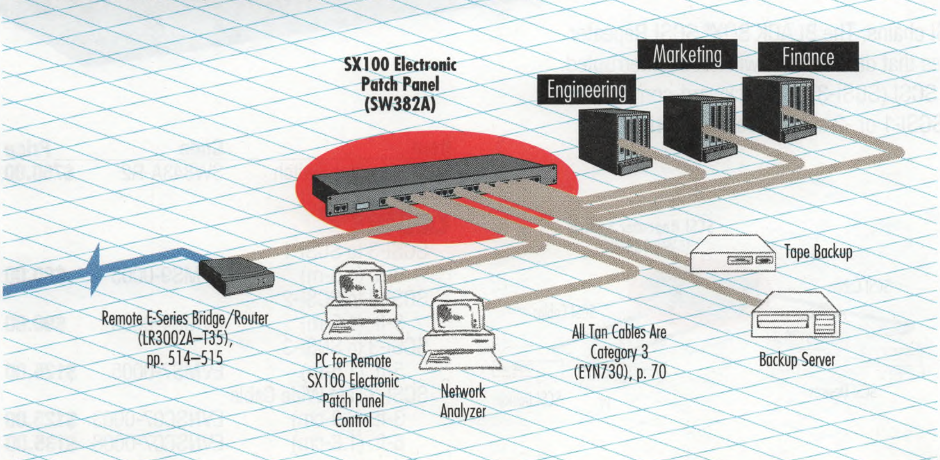
NOTE: For 10BASE-T Ethernet and AS/400 applications connecting to the SX100, call Technical Support to see if you need custom cables.

SPECIFICATIONS

Leads Supported — 4-wire
CE Approval — All items listed are approved
Connectors — All: (1) DB25 Serial in, (1) RJ-12 daisychain in, (1) RJ-12 daisychain out, (1) DB15 female for memory module
SW380A: (24) RJ-45 in, (24) RJ-45 out;
SW381A: (2) 50-pin telco in, (2) 50-pin telco out;
SW382A: (24) RJ-45 in, (48) RJ-45 out;
SW383A, SW384A: (2) 50-pin telco in, (4) 50-pin telco out
Indicators — (5) LEDs: PWR, Fault, Memory, Receive, Transmit
Power — 115/230 VAC, 60/50 Hz, switch-selectable
Size — SW380A–SW381A: 1.7"H x 19"W x 11.8"D (4.4 x 48.3 x 30 cm);
SW382A–SW384A: 3.5"H x 19"W x 11.8"D (8.9 x 48.3 x 30 cm)
Weight — SW380A, SW382A: 10 lb. (4.5 kg);
SW381A, SW383A–SW384A: 19 lb. (8.6 kg)

Item	Code	Price
SX100 Electronic Patch Panel		
24 in x 24 out 2-Pair RJ-45 (Pins 3–6)	SW380A	**$2495.00**
50-Pin Telephone Wire	SW381A	**$2495.00**
24 in x 48 out 2-Pair RJ-45 (Pins 3–6)	SW382A	**$2995.00**
50-Pin Telephone Wire	SW383A	**$2995.00**
48 in x 48 out 2-Pair 50-Pin Telephone Wire	SW384A	**$4995.00**

Control Your LAN/WAN from Your PC.


SX100 Electronic Patch Panel (SW382A)
Marketing
Finance
Engineering
Tape Backup
Backup Server
Remote E-Series Bridge/Router (LR3002A–T35), pp. 514–515
PC for Remote SX100 Electronic Patch Panel Control
Network Analyzer
All Tan Cables Are Category 3 (EYN730), p. 70

Black Box Explains...

New SCSI Terminology.

SCSI terminology has changed to keep up with the latest technical developments.

All devices previously classified as SCSI-2 are now categorized as **Fast SCSI**. Devices referred to as SCSI-3 are designated as either **Ultra SCSI** or **Ultra2 SCSI**. Ultra SCSI also includes devices that are classified as Fast 20 and Double-Speed SCSI. And Ultra2 SCSI includes Fast 40 devices.

One SCSI designation remains the same—all SCSI-1 products retain that familiar classification.

Manual SCSI Switch

Simple, Low-Cost SCSI Peripheral-Sharing—Now Supports Ultra SCSI.

- **One computer can access two SCSI devices.**
- **Or two computers can share a SCSI device.**

Switch among PCs and SCSI disk drives, tape drives, laser printers, scanners—and more—with the BLACK BOX® Manual SCSI Switch. Now the Manual SCSI Switch also supports Ultra SCSI. Ultra SCSI (SCSI-3) is backward-compatible with SCSI-1 and SCSI-2. All you need are the SCSI-3 to SCSI-1 or SCSI-2 cables listed **below**.

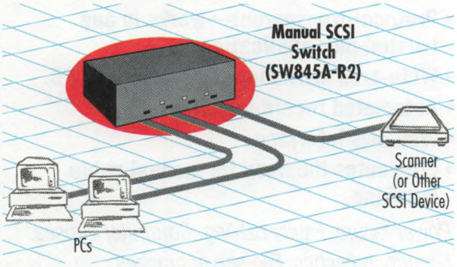
To prevent data loss, the Switch delays switching until the bus is quiet for eight seconds. Even if the Switch loses power, it remembers to send data to the correct port. Because the Switch is all solid-state, data transfer for both SCSI-1 and SCSI-2 devices is clean. The Switch uses no SCSI ID, so it can forward all data instantly.

FAXBACK INFORMATION
Request Document Number: 12094
Call 412-746-5500 Anytime

BLACK BOX
(412) 746-5500
SCSI Switch II
Power
Port A
Port B
Port C

SPECIFICATIONS

Standards — Fast SCSI (SCSI-2) and Ultra SCSI (SCSI-3)
Protocol — Synchronous and asynchronous
CE Approval — 230-VAC version: SW845AE-R2
Connectors — (3) 68-pin telco female
Power — 9 VDC 500 mA
Size — 2.3"H x 8.1"W x 4.3"D (5.7 x 20.5 x 10.8 cm)
Weight — 1.4 lb. (0.6 kg)


Manual SCSI Switch (SW845A-R2)
Scanner (or Other SCSI Device)
PCs

Item	Code	Price
Manual SCSI Switch	SW845A-R2	**$495.00**
remember to order **cables**		
SCSI-3 to SCSI-1		
5-ft. (1.5-m)	EVMS9-0005	**$80.00**
SCSI-3 to SCSI-2		
5-ft. (1.5-m)	EVMS4-0005	**$90.00**
SCSI-3 to SCSI-3		
5-ft. (1.5-m)	EVMS7-0005	**$125.00**
SCSI-3 Fast Wide Cable		
3-ft. (0.9-cm)	EVNSC07-0003	**$125.00**
6-ft. (1.8-cm)	EVNSC07-0006	**$135.00**

• • • • • •

SCSI Repeater Switch

Reach Two 20-Foot SCSI Chains: This Manual Switch Has a Built-In Repeater.

- **Switch between one main SCSI chain and two other SCSI chains.**
- **Expand your system—to up to 40 feet of total cabling.**
- **Now supports Ultra SCSI (SCSI-3).**

Now Supports Ultra SCSI
BLACK BOX
(412) 746-5500
SCSI Switch / Repeater
Power
Port A
Port B

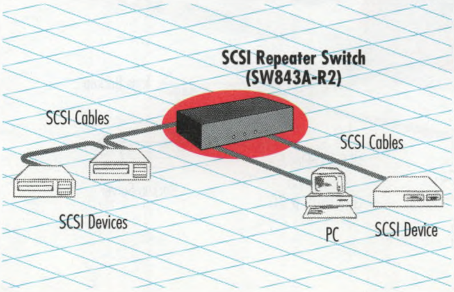
Now one user can share devices on two other SCSI chains. The BLACK BOX® SCSI Repeater Switch's built-in logic monitors bus activity and ensures that data transfer will not be interrupted.

And the SCSI Repeater Switch now supports Ultra SCSI (SCSI-3). It's backward-compatible with SCSI-1 and SCSI-2—all you need are SCSI-3 to SCSI-1 or -2 cables available **at right**.

SPECIFICATIONS

CE Approval — Yes
Interface — Fast SCSI (SCSI-2), wide, Ultra SCSI
Connectors — (3) High-density 68-pin position Ultra SCSI (SCSI-3); (2) pushbuttons; (1) DC power jack
Power — Modular AC supply; 5 VDC at 4A
Size — 2.3"H x 8.1"W x 4.3"D (5.7 x 20.5 x 10.8 cm)
Weight — 1.1 lb. (0.5 kg)

FAXBACK INFORMATION
Request Document Number: 13356
Call 412-746-5500 Anytime



Item	Code	Price
SCSI Repeater Switch	SW843A-R2	**$750.00**
remember to order **cables**		
SCSI-3 to SCSI-1		
5-ft. (1.5-m)	EVMS9-0005	**$80.00**
SCSI-3 to SCSI-2		
5-ft. (1.5-m)	EVMS4-0005	**$90.00**
SCSI-3 to SCSI-3		
5-ft. (1.5-m)	EVMS7-0005	**$125.00**
SCSI-3 Fast Wide Cable		
3-ft. (0.9-cm)	EVNSC07-0003	**$125.00**
6-ft. (1.8-cm)	EVNSC07-0006	**$135.00**

SCSI Matrix Switch

Connect, Share, and Extend SCSI Devices.

- **Share up to 28 SCSI peripheral devices.**
- **Ideal for "high-availability" applications—which means low downtime.**
- **Available for Single-Ended, Differential, Narrow, and Wide SCSI.**
- **Remote switching from the RS-232 port.**

Select and connect up to six independent SCSI buses—in any combination. The SCSI Matrix Switch eliminates the need to swap and reconfigure SCSI cables and bus terminators each time a new system configuration is required! A rear-panel switch controls internal "active" terminators for each individual port.

The Matrix Switch is fully compliant with all SCSI-1, -2, and -3 specifications and is compatible with numerous computer platforms—Sun®, Apple®, HP®, IBM®, DEC™, Unisys®, *and more.*

A standard RS-232 serial interface can be used to operate and control the Matrix Switch using supplied Windows®, Macintosh®, and UNIX® software. And the Switch supports Fast SCSI 40-Mbps devices in async and sync modes.

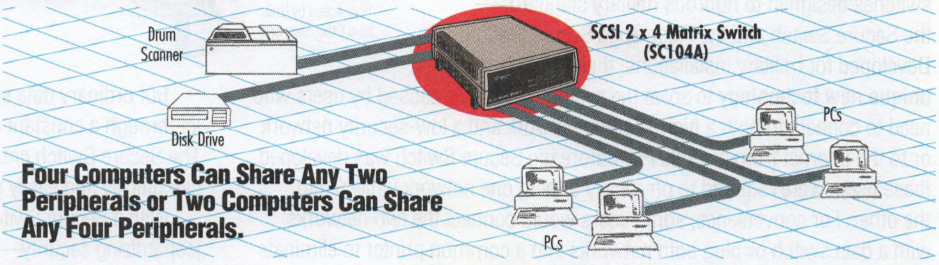
Your data is safe, too. Internal circuitry monitors the active SCSI ports and won't change the Matrix Switch's configuration until the bus is free. Choose from two types of Switches.

FAXBACK INFORMATION
Request Document Number: 16184
Call 412-746-5500 Anytime

BLACK BOX
(412) 746-5500
SCSI Matrix Switch
PORT A
PORT B
1
2
3
4

SPECIFICATIONS

Speed — 8-Bit Narrow: Up to 20 Mbytes per second; 16-Bit Wide: Up to 40 Mbytes per second
CE Approval — All items listed are approved
Connectors — Serial interface: (1) 9-pin D-sub
Power — 105–240 VAC ±10%, 48–65 Hz, 20 W
Size — 4.5"H x 11.3"W x 9.7"D (11.4 x 28.7 x 24.6 cm)
Weight — 5.1 lb. (2.3 kg)



Four Computers Can Share Any Two Peripherals or Two Computers Can Share Any Four Peripherals.

Single-Ended Matrix Switch

Cable lengths up to 6 m (19.7 ft.) can be connected to each port—total distance between connected devices can be up to 12 m (39.4 ft.)!

Differential Matrix Switch

You get all the benefits of the Single-Ended Matrix Switch **plus** increased noise immunity when SCSI devices are operated over long cables.

Item	Code	Price
SCSI Matrix Switch		
Single-Ended		
2 x 2	SC100A	**$1195.00**
2 x 4 Narrow, 50-Pin Centronics®	SC104A	**$1495.00**
Narrow, 50-Pin High-Density	SC105A	**$1595.00**
Wide, 68-Pin High-Density	SC106A	**$2195.00**
Differential		
2 x 2	SC110A	**$1195.00**
2 x 4 Narrow, 50-Pin Centronics	SC114A	**$1495.00**
Narrow, 50-Pin High-Density	SC115A	**$1595.00**
Wide, 68-Pin High-Density	SC116A	**$2195.00**

• NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $

SCSI Switch (for AS/400®)

AS/400 Hosts Share ½-inch IBM Tape Drives—*AUTOMATICALLY!*

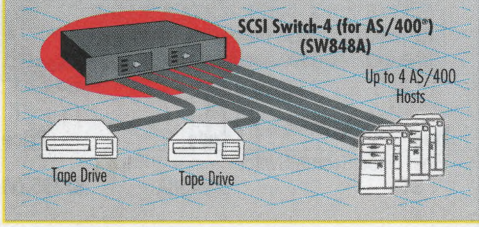
Fits 3490E & Clones

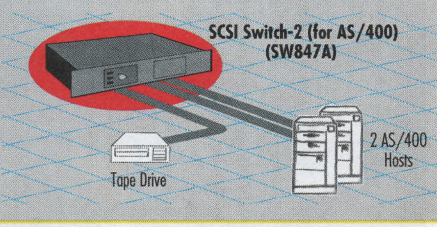
- **Share host access to expensive IBM® 3490E tape drives, with 4-to-2 or 2-to-1 models.**
- **32-bit Fast-Wide SCSI interface transfers data in a flash—perfect for AS/400 systems!**
- **Intelligent unattended switching—dynamic host-to-drive allocation is fully automatic and 100% transparent to operation.**

Black Box presents AS/400® system managers with *the year's biggest money-saving idea!* Instead of spending $25,000 (or more!) on another 3490E ½" tape drive for daily backups, you can share the drive you already own. You start saving the *very instant* you plug in the Switch.

SCSI Switches bring you the speed and performance of the SCSI-3 Fast-Wide interface. And a manual override switch ensures complete protection if your host CPU fails.

FAXBACK INFORMATION
Request Document Number: 15695
Call 412-746-5500 Anytime





SPECIFICATIONS

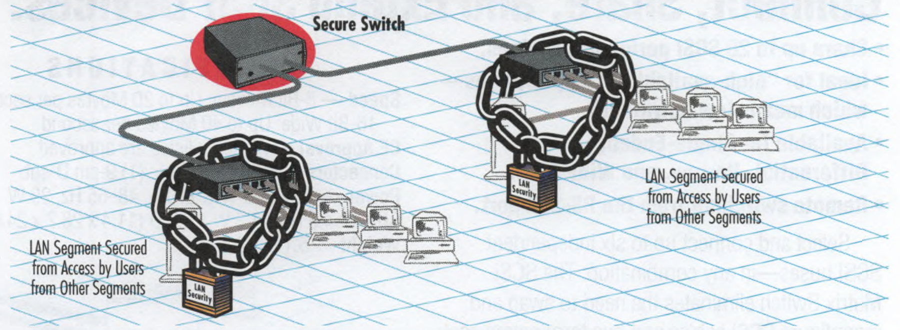
Compatibility — IBM 3490-EXX, Decision Data 7490E, Philips/LMS 36XO, IPL 6790E-AXX Tape Drives
Software — Requires at least OS/400® V2, R3
Speed — 20 Mbps
Interface — SCSI-3 Fast-Wide
Connectors — 68-pin SCSI-3
Power — 115–230 VAC, 60–50 Hz (autosensing)
Size — 3.3"H x 19"W x 26.3"D (8.4 x 48.3 x 66.8 cm)
Weight — 21 lb. (9.8 kg)

Item	Code	Was	NOW!
SCSI Switch-2 (for AS/400) (2 Hosts to 1 Drive)	SW847A	~~$7495.00~~	**$5795.00**
SCSI Switch-4 (for AS/400) (4 Hosts to 2 Drives)	SW848A	~~$8995.00~~	**$5995.00**

NOTE: Cables are included.

Top Secret *Stays* Top Secret When You Secure Your LAN.

EXCLUSIVE


Secure Switch
LAN Segment Secured from Access by Users from Other Segments
LAN Security
LAN Segment Secured from Access by Users from Other Segments
LAN Security

How secure is your LAN? What's it connected to? Does it have a back door? What about that shared printer? Can your LAN be infiltrated by hackers, industrial spies, enemy agents, or anyone with the right password? Are you willing to take that chance?

Now Black Box brings you the only LAN security switches designed to rigorous military standards—the Secure Switch and the Fiber Optic Secure Switch. Developed for military installations, these Switches use **unique new technology** to solve the security problems caused by users who need to connect to both a high-security network and a low-security network or to the Internet from a single PC. Before the Secure Switch was developed, these users were required to physically unplug one network while using the other. For convenience, some users would connect the two networks with a data switch or plug both networks into a common printer to eliminate the bother of constantly plugging and unplugging connectors.

But ordinary data switches and peripherals are not secure; they can let through a constant stream of electrons—a potential gateway for leaks. The Secure Switch creates a physical break between the networks. Users can quickly and easily switch back and forth without risking security.

With a Secure Switch one computer can access two networks without jeopardizing security—each network stays completely isolated from the other. So you never have to worry about who's "tiptoeing" through your LAN at night.

Secure Switch Total Security for Ethernet-Based Networks.

- **Designed to rigorous military standards.**
- **Protect high-security networks.**
- **Individually shielded switch assemblies prevent coupling between the networks.**

When government agencies and the military need a security switch for their networks, this is the switch they turn to. The Secure Switch was developed to meet stringent military specifications and is the only data-network security switch approved for use in many government installations.

The Secure Switch is designed to maintain an AIS platform with two different removable data cartridges containing separate operating systems—one for classified processing, one for unclassified—or when an internal hard drive isn't permitted.

The Secure Switch is available in models to connect two Ethernet networks or an Ethernet and an AppleTalk® network.

SPECIFICATIONS

Connectors — SW456A: (4) RJ-45;
SW457A: (2) RJ-45, (2) RJ-11
Power — Nonpowered
Size — 2.8"H x 6"W x 6.3"D (7.1 x 15.2 x 16 cm)
Weight — 4 lb. (1.8 kg)

FAXBACK INFORMATION
Request Document Number: 17446
Call 412-746-5500 Anytime

BLACK BOX
(412) 746-5500
SecureSwitch

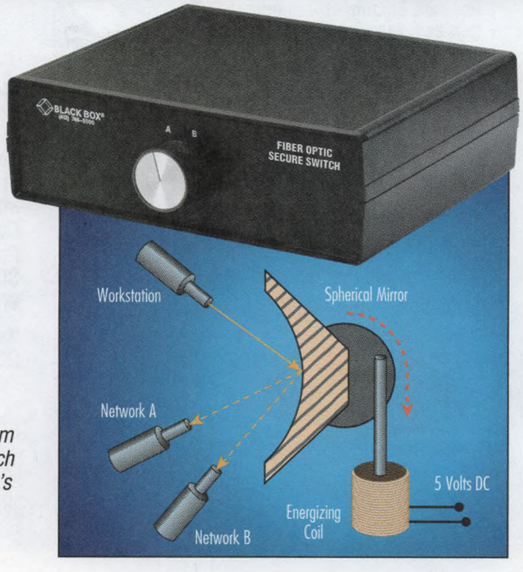
Users can easily switch between networks without having to plug and unplug connectors manually, minimizing wear and tear.

Item	Code	Price
Secure Switch		
Ethernet/Ethernet	SW456A	**$595.00**
(Government Customers: Use part #A1AA13784)		
Ethernet/AppleTalk	SW457A	**$595.00**

Fiber Optic Secure Switch Total Security for Fiberoptic Networks.

- **Optical switching—no electronics.**
- **Unique mirrored switching mechanism foils hackers.**
- **The *only* fiberoptic switch designed to rigorous military standards.**

Here's ultimate military-caliber security for advanced fiberoptic networks. When you select another network, a precision mirror rotates to make the switch. There are ***no*** electronic connections between fiberoptic networks—***ever***. So your high-security data stays secure.



The Fiber Optic Secure Switch features a unique mirrored switching mechanism that redirects light from one port to another. The only power used by the Switch is the DC power used to redirect the mirror—so there's no possibility of an electrical connection between networks.

SPECIFICATIONS

Compatibility — 62.5/125 µm multimode fiber
Optical Loss — 0.5 dB typical per FOTP-34 method B
Switching Speed — 5 msec typical, 10 msec maximum
Connectors — (6) ST
Power — 115-VAC, 60-Hz wallmount power supply, 5-VDC output
Size — 2.8"H x 8"W x 6.3"D (7.1 x 20.3 x 16 cm)
Weight — 4 lb. (1.8 kg)

FAXBACK INFORMATION
Request Document Number: 17831
Call 412-746-5500 Anytime

Item	Code	Price
Fiber Optic Secure Switch		
ST®	SW458A	**$1395.00**

Get CONNECTED!

TIPS & TECHNIQUES

TRENDS & DIRECTIONS

APPLICATION BRIEF

CONNECTIONS CORNER

CONSIDER THESE SOLUTIONS

TECHNICAL FORUM

BLACK BOX® June 1997

Connectivity NEWS℠

Contents:

1 TIPS AND TECHNIQUES
The Magic of DVD.

5 TRENDS & DIRECTIONS
FEATURE
Critical Components for Unique Connections—**Terminal Servers**.

11 APPLICATION BRIEF
Thinking about **Terminal Servers**? Consider this real-life example.

12 CONNECTIONS CORNER
UltraSCSI.

15 CONSIDER THESE SOLUTIONS for...
V.34 Modems... Manual Switch Cabling Problems... Premise Wiring...

16 TECHNICAL FORUM
Q&A with the Black Box experts!

TIPS AND TECHNIQUES

The Magic of DVD

Imagine being able to hold 17 GB of data in the palm of your hand. How about 8 hours' worth of movies in surround sound? Or a phone directory of the whole United States? Think it's an illusion? Not if you have DVD.

DVD (Digital Versatile Disc) technology is poised to be the next act on the PC/multimedia stage. A DVD is, in the simplest sense, a high-capacity, high-performance Compact Disc (CD). It has the potential to transform the way we store data and profoundly affect the computer-game and home-video markets.

The Trick Is in the Laser.

DVDs are the same size as CDs—5¼". Both types of discs are 2.1-mm thick. The difference is in the way each technology uses a laser beam to read the data. Both DVDs and CDs have microscopic pits on them that represent data. On a Digital Video Disc, however, these pits are closer together and they're read by a laser that uses a shorter-wavelength light. Because of this advance in technology, a DVD can store from seven to 26 times more data than a conventional CD (see **Figure 1**). While a CD can hold 650 MB of data, a regular single-sided, single-layered DVD can store up to 4.7 GB. In fact, DVDs can actually store two layers of information on one side with a semi-transparent gold layer on top of a reflective silver layer. Two layers make it possible to store up to 8.5 GB on one side of a DVD—the storage capacity isn't quite double that of a standard DVD because of the lens technology. However DVDs also can have two usable sides!

DVD 17 GB Double-Layered Double-Sided
26 CDs
DVD 9.4 GB Single-Layered Double-Sided
14 CDs
DVD 8.5 GB Double-Layered Single-Sided
13 CDs
DVD 4.7 GB Single-Layered Single-Sided
7 CDs
CD 650 MB
1 CD

Figure 1—See How DVD Stacks up Compared to CD-ROM.

(continued on page 2)

1

Stay CONNECTED!

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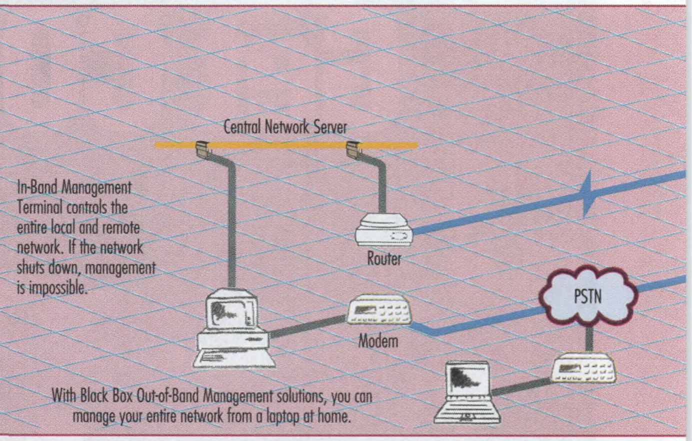
Call Today: 412-746-5500

Out-of-Band Management— the Next Best Thing to Being On-Site...

Don't Fear the Pager—The next time you're buzzed for an off-site service call, just dial up these Black Box Out-of-Band Management solutions to get all your remote devices back up and running.

Reboot, switch power off or on, even control remote network devices—all from the comfort of your office or home.

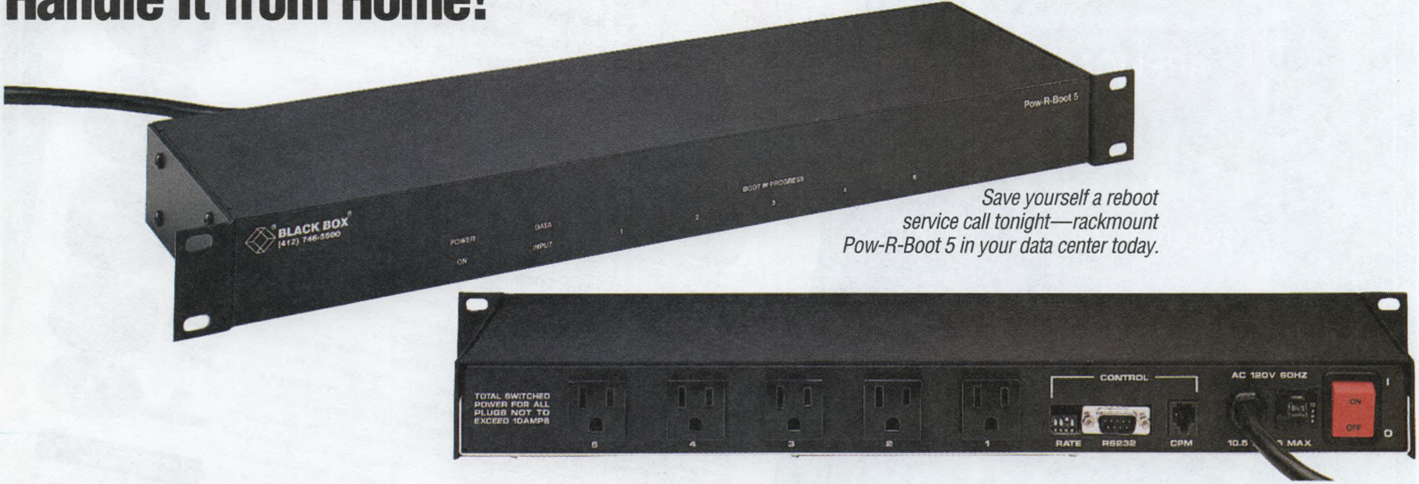
VIPreview
Ask for our
Server Management VIPreview.


Central Network Server
In-Band Management Terminal controls the entire local and remote network. If the network shuts down, management is impossible.
Router
Modem
PSTN

With Black Box Out-of-Band Management solutions, you can manage your entire network from a laptop at home.

Pow-R-Boot 5

Another Reboot Service Call? Don't Go— Handle It from Home!


Pow-R-Boot 5
BLACK BOX
(412) 746-5500
POWER
ON
DATA
INPUT
BOOT IN PROGRESS
TOTAL SWITCHED POWER FOR ALL PLUGS NOT TO EXCEED 10AMPS
CONTROL
RATE
RS232
CPM
AC 120V 60HZ
ON
OFF

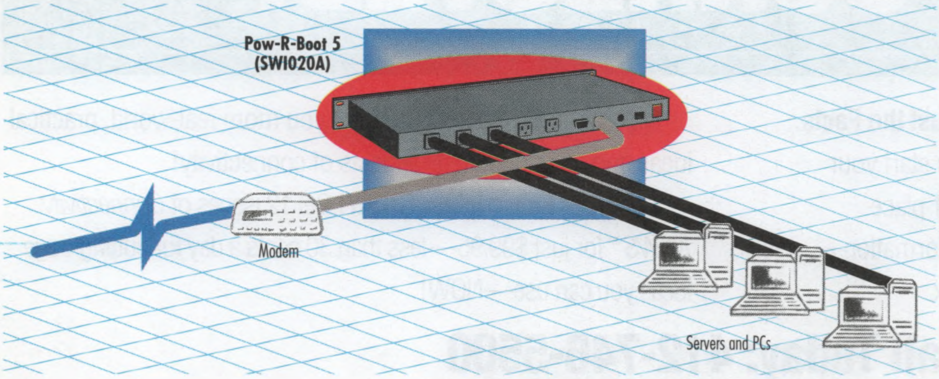
Save yourself a reboot service call tonight—rackmount Pow-R-Boot 5 in your data center today.

- **Remotely toggles AC power to any one of five separate outlets.**
- **Dialup modem link enables cold reboot of locked devices anywhere!**
- **Selectable short/long OFF cycle provides enough delay to boot any device.**

End those midnight reboot service runs! Dial up Pow-R-Boot 5. It toggles AC power OFF and ON to any remote device plugged into its five outlets.

Just call from a remote workstation via a dialup modem. Send an eight-character string from any RS-232 device to toggle power and kickstart your faraway equipment. Pow-R-Boot 5 also verifies successful restarts. On your command, AC power cycles OFF for two to eight seconds, then back ON to the appropriate device, while Pow-R-Boot 5's command port reports status activity.

Get Pow-R-Boot 5 today—stay home tonight.


Pow-R-Boot 5
(SWI020A)
Modem
Servers and PCs

To reboot locked devices, toggle AC power OFF and then ON. It's just like flipping the power switch!

SPECIFICATIONS

Speed — 300, 1200, 2400, or 9600 bps, switch-selectable

CE Approval — Available (SWI020AE, 230-VAC version)

Interface — RS-232

Connectors — Modem: (1) DB9 female; Power: (5) grounded plug outlets each rated at 10 amps max.

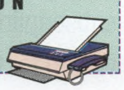
Indicators — (7) LEDs: (1) Power On, (1) Data Input, (5) Boot in Progress

Power — 115 VAC, 60 Hz, 10 amps max.

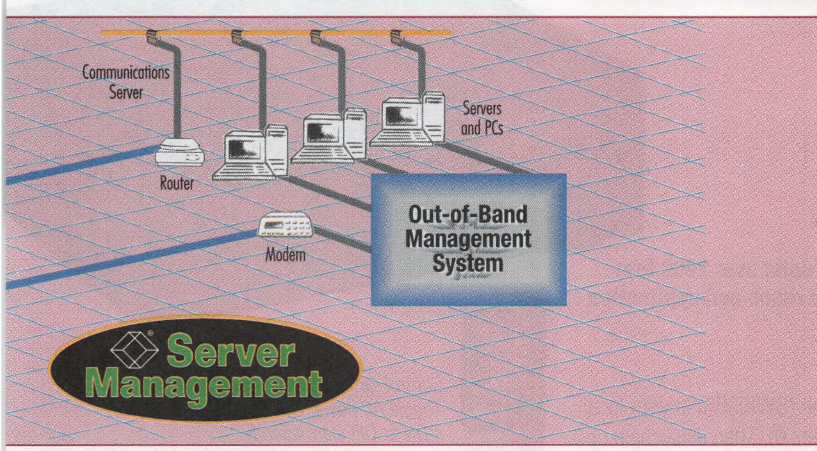
Size — 1.8"H x 19"W x 6.5"D (4.6 x 48.3 x 16.5 cm)

Weight — 5 lb. (2.3 kg)

FAXBACK INFORMATION
Request Document Number: 15640
Call 412-746-5500 Anytime



Item	Code	Price
Pow-R-Boot 5	SWI020A	**$425.00**


Communications Server
Router
Modem
Servers and PCs
Out-of-Band Management System
Server Management

Black Box Explains...

Out-of-Band Management.

This term refers to an alternate communication circuit, usually a dialup or leased modem line, used by network managers to connect and control remote network devices. This separate circuit is independent of the main network link (out-of-band) and provides a secondary route for managers to control remote equipment without disrupting activity on the main circuit.

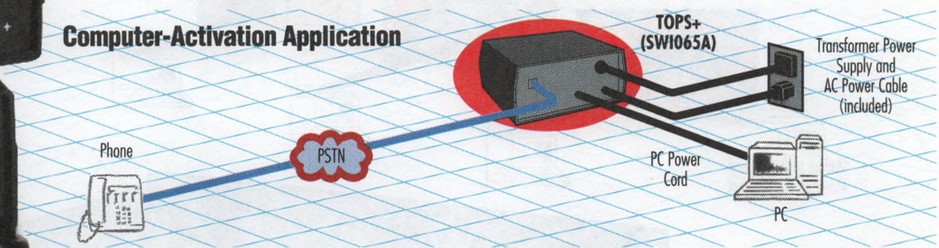
Many network control devices such as Switches, LAN Bridges, and Routers feature built-in OBM ports to support this redundant backup link. In fact, when a main data line fails, OBM ports can provide a single point of access to maintain operation of multiple mission-critical remote devices.

Tone-Operated Power Switch Plus

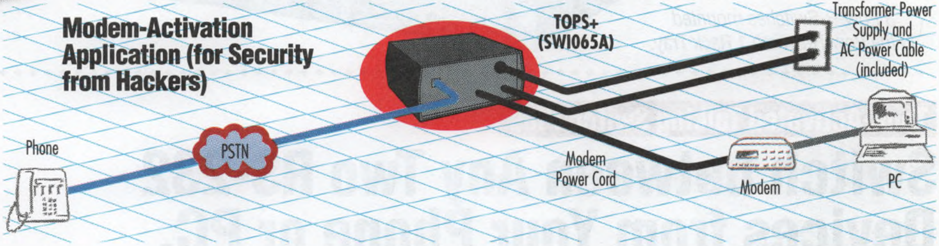
ACCESS CODE
A1
A2
A3
A4
PWR
RST
OUTPUT RECEPTACLE
1
TOPS +
BLACK BOX®
RJ Connector
Receptacle 1
Power

Call from Anywhere—and Perform a Master Reset on Any Connected Device. No Modems Required!

Computer-Activation Application


TOPS+ (SWI065A)
Transformer Power Supply and AC Power Cable (included)
Phone
PSTN
PC Power Cord
PC

Modem-Activation Application (for Security from Hackers)


TOPS+ (SWI065A)
Transformer Power Supply and AC Power Cable (included)
Phone
PSTN
Modem Power Cord
Modem
PC

EXCLUSIVE

- **Remotely operated touchtone-controlled ON/OFF switching.**
- **Provides verbal status information and command verification, then responds to your commands.**
- **Four-digit touchtone security code keeps out intruders.**
- **Comes with 1 or 4 AC outlets; each outlet can be operated separately.**
- **Plugs into a standard phone line.**

Your file server locked up and took down the network again? It's not a problem anymore—if you have the Tone-Operated Power Switch Plus (TOPS+) from Black Box. With this remotely operated ON/OFF Switch, you can call from any touchtone phone and perform a Master Reset on your system, reboot your equipment, or turn any of four connected devices on or off.

TOPS+ gives you status information, telling you whether your connected equipment is on or off, and then confirms your instructions. Its built-in security keeps your system safe: The four-digit access code allows three attempts before it shuts down—and shuts out intruders.

FAXBACK INFORMATION
Request Document Number: 14979
Call 412-746-5500 Anytime

SPECIFICATIONS

FCC Registration — Complies with FCC Part 68 and Part 15A
Leads Supported — AC Hot switched, AC Neutral and Ground not switched
Relay Contacts — Rated 230 VAC, 15 A maximum
Ringer Equivalence — 0.5 B
Connectors — (1) RJ-11, (1) or (4) AC outlet (3-prong) female, (1) 5-pin DIN female
Power — 115 VAC, 60 Hz
Size — 3.3"H x 8"W x 6.3"D (8.4 x 20.3 x 16 cm)
Weight — 2.4 lb. (1.1 kg); with transformer (included), 2.9 lb. (1.3 kg)

Item	Code	Price
Tone-Operated Power Switch Plus (TOPS+)		
1 Receptacle	SWI065A	**$580.00**
4 Receptacles	SWI066A	**$795.00**

Pow-R-Switch (1M and1S)

Switch It On! Switch It Off! Toggle On and Off! Here's Total AC Power Control.

BLACK BOX
(412) 746-5500
Pow-R-Switch IM
AC ON
LINK
RDY

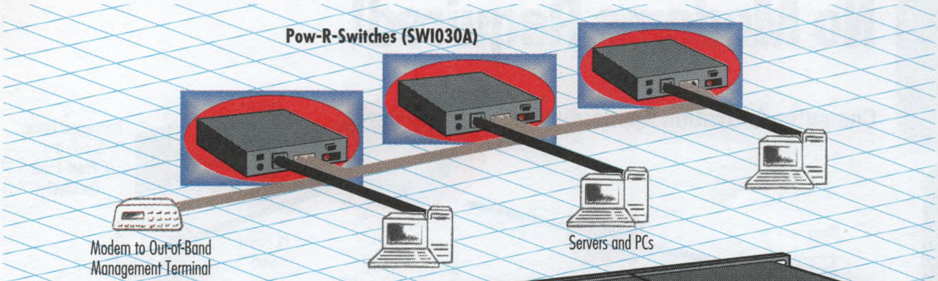
- **Simple RS-232 character strings control power to ten remote devices.**
- **Three switch options: On, Off, or Toggle—for total control!**
- **Daisychain satellite units over 2000 feet (610 m) for maximum reach and application flexibility.**

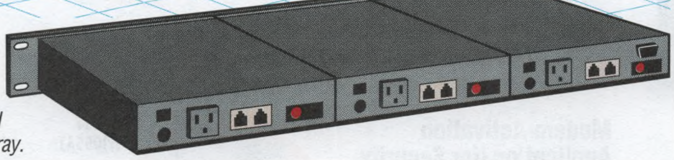
Choose the new Pow-R-Switch when you need more than simple ON/OFF AC power control to reboot remote network devices. With this Switch, you can shut down distant devices or power up dormant ones—permanently!

And they all don't have to be located in the same data center. With a maximum end-to-end link distance of up to 2000 feet, you can extend the reach of your remote network control to include up to ten devices anywhere you need them.

Install one Master unit (SWI030A) at your local management site (Address 0). Then daisychain up to nine Satellite units (SWI031A) throughout your remote site (Addresses 1–9) for one-to-one AC power switching. Control each remote device via dialup modem just by transmitting the ASCII control strings. For convenience, rackmount three Satellite modules in one optional Rack Tray.

Control remote devices completely: Toggle AC power OFF and ON or switch it ON or OFF permanently.





3 Pow-R-Switches mounted in the Pow-R-Switch 1 Rack Tray.

SPECIFICATIONS

Speed — 2400, 9600 bps, switch-selectable
CE Approval — Available (SWI030AE–SWI031AE, 230-VAC versions)
Interface — RS-232
Connectors — DB9 female
Indicators — (3) LEDs: AC Power On, Link Activity, Ready
Power — 115 VAC, 60 Hz, 10 Amps max.
Size — Standalone Units: 1.7"H x 5.5"W x 5"D (4.3 x 13.9 x 12.7 cm);
Rackmount Tray: 1.8"H x 19"W x 5.5"D (4.6 x 48.3 x 13.9 cm)
Weight — 2 lb. (0.9 kg)

FAXBACK INFORMATION
Request Document Number: 15657
Call 412-746-5500 Anytime

Item	Code	Price
Pow-R-Switches		
1M (Master)	SWI030A	**$185.00**
1S (Satellite)	SWI031A	**$165.00**
Pow-R-Switch 1 Rack Tray	SWI032	**$35.00**

◆ ◆ ◆

Tone-Activated Talking Switch Plus

Switch between Any Two RS-232 Devices from Your Phone or PC.

EXCLUSIVE
BLACK BOX
TATS+
ACCESS CODE
PORT A
COMMON
PORT B
Power

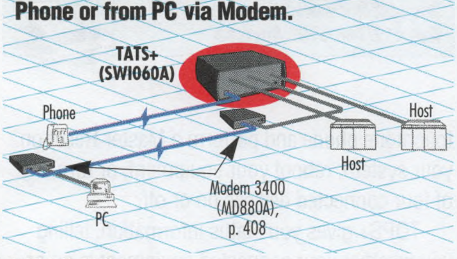
- **Remotely operated ABC switch.**
- **Four-digit security code keeps intruders out.**
- **Provides full status information.**

The convenience of TATS, plus security.

Call in from any touchtone phone, and TATS+ switches between any two connected devices on command.

TATS+ is secure, too. A security code keeps intruders out of your system.

Switching Is Controlled from Touchtone Phone or from PC via Modem.



SPECIFICATIONS

FCC Registration — Complies with FCC Part 68 and Part 15A
Leads Supported — 2–8, 15, 17, 20, 22–25
Relay Contacts — Rated 115 VAC, 5 A
Ringer Equivalence — 0.5 B
Connectors — (1) RJ-11, (3) DB25, (1) 5-pin DIN
Power — 115 VAC, 60 Hz
Size — 3.3"H x 8"W x 6.3"D (8.4 x 20.3 x 16 cm)
Weight — 3 lb. (1.4 kg); with transformer (included), 4 lb. (1.8 kg)

Item	Code	Price
Tone-Activated Talking Switch Plus (TATS+)	SWI060A	**$515.00**

Pow-R-Switch (4L, 8L, 4C, and 8C)

RS-232 Activated Switches Control Power to Remote Devices—by Lead or by Code.

EXCLUSIVE
Pow-R-Switch 8L
BLACK BOX®
1
2
3
4
5
6
7
8
ON

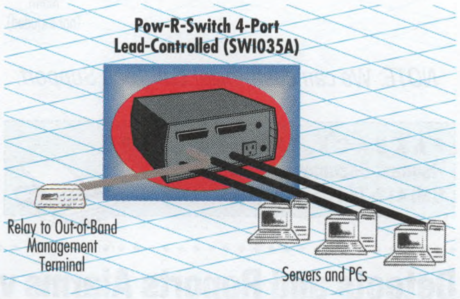
Both 8-port models have rackmountable faceplates with mounting tabs and handles for easy installation.

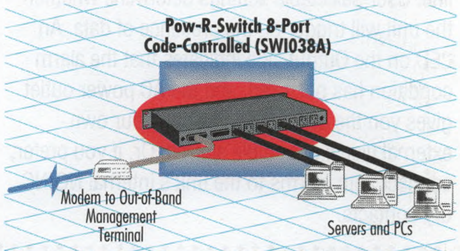
- **Lead Control operates via hardware handshake signals (DTR/RTS).**
- **Code Control switches power by sensing codes for up to 256 devices.**

With BLACK BOX® Pow-R-Switches, you can use your local or remote PC to switch AC power to faraway accessory devices, alarms, and more.

Just dial in on your RS-232 data line to switch power ON or OFF—by lead or by code—to one or to all remotely attached devices.

FAXBACK INFORMATION
Request Document Number: 15664
Call 412-746-5500 Anytime


Pow-R-Switch 4-Port Lead-Controlled (SWI035A)
Relay to Out-of-Band Management Terminal
Servers and PCs


Pow-R-Switch 8-Port Code-Controlled (SWI038A)
Modem to Out-of-Band Management Terminal
Servers and PCs

SPECIFICATIONS

Interface — RS-232
Connectors — All: (2) DB25 female;
SWI035A: (4) AC receptacles;
SWI036A: (8) AC receptacles;
SWI037A: (2) RJ-11, (4) AC receptacles;
SWI038A: (2) RJ-11, (8) AC receptacles
Indicators — LEDs: (1) Power; (4 or 8) Output Status
Power — Input: 5 VDC from 115-VAC, 60-Hz wallmount transformer;
Output: 15-amp per port limit, 15-amp aggregate limit
Size — 4-Port: 2.5"H x 8"W x 6.3"D (6.4 x 20.3 x 16 cm);
8-Port: 1.8"H x 19"W x 8"D (4.6 x 48.3 x 20.3 cm)
Weight — 4-Port: 3 lb. (1.4 kg); 8-Port: 8 lb. (3.6 kg)

Item	Code	Price
Pow-R-Switches		
Lead-Controlled		
4-Port Desktop	SWI035A	**$315.00**
8-Port Rackmount	SWI036A	**$390.00**
Code-Controlled		
4-Port Desktop	SWI037A	**$465.00**
8-Port Rackmount	SWI038A	**$559.00**

◆ ◆ ◆

Lead-Sensing Relay

Power Up Your PC via Modem.

- **Front-panel RS-232 DB25 connector eliminates the need for Y cable.**
- **Front-panel LEDs for Power and Switched output.**
- **Front-panel Enable/Disable switch for output.**

Run your PC only when you need it with our enhanced Lead-Sensing Relay.

Just dial in from your remote modem. The modem signal trips the BLACK BOX® Lead-Sensing Relay. Then the Relay sends power to your PC. Your PC boots into remote-access software, and you're ready to go.

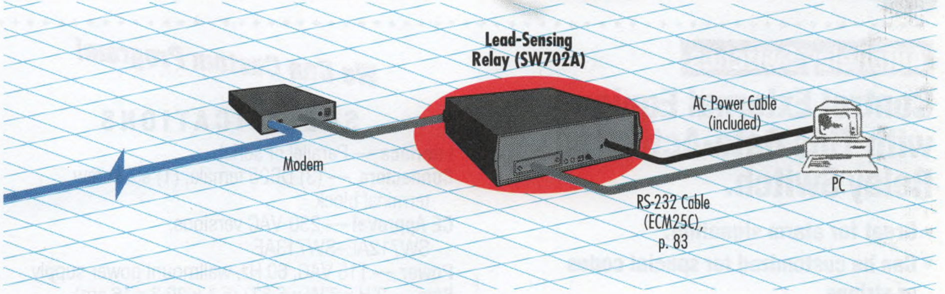
The Relay uses the RS-232 output from your remote modem to switch power on and off. Relay output is switched 115-VAC power. You can also configure the output for dry-contact operation, either normally open (off) or normally closed (on), depending on your application. Call Technical Support for details.

When the Relay sends power to your PC, the Switched LED on the front panel lights up. Another front-panel feature, the Disable switch, prevents the Relay from being switched on accidentally—or by a hacker. With the Reset button, you can override the ring-indicate setting.

SPECIFICATIONS

Controls — Reset, disable
Monitored Signal — Ring Indicator and/or Carrier Detect
Output — Dry contact or switched AC, 5 amps
Connectors — (1) DB25 female, (1) DB25 male, (1) AC outlet (3-prong) female
Indicators — (2) LEDs: Power, Switched (relay-activated)
Power — 115/230 VAC, switch-selectable
Size — 2.5"H x 8"W x 6.3"D (6.4 x 20.3 x 16 cm)
Weight — 3 lb. (1.4 kg)

EXCLUSIVE
OUTPUT
DATA OUT
POWER
SWITCHED
RESET
DISABLE
DATA IN
TIMER


Lead-Sensing Relay (SW702A)
AC Power Cable (included)
Modem
PC
RS-232 Cable (ECM25C), p. 83

FAXBACK INFORMATION
Request Document Number: 14962
Call 412-746-5500 Anytime

Item	Code	Price
Lead-Sensing Relay	SW702A	**$200.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

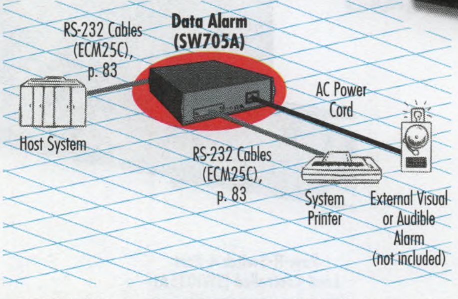
For other lengths, see p. 83.

Data Alarms Don't Get Caught Off-Guard—Alert Support Staff to Problems *Immediately*.

EXCLUSIVE
BLACK BOX (412) 746-5500
RS-422 Data Alarm
OUTPUT
OUTPUT
RESET
DISABLE

- **Responds to the presence of data on your line.**
- **Monitors system alarm printers, job tool operations, or modems going off-hook.**
- **Parallel, RS-232, and RS-422 versions.**

Connect a BLACK BOX® Data Alarm in line with the data to be monitored, and the Data Alarm responds automatically to the presence of data on the TX and RX leads of your communication line. User-selectable settings determine whether the unit will trigger on the presence of data. An LED on the Output side indicates that the alarm condition has occurred, and the AC power outlet gives you the option of activating your own external visual or audible alarms. Or, if you prefer, connect your alarms to the unit's internal NO/NC dry contacts.


RS-232 Cables (ECM25C), p. 83
Data Alarm (SW705A)
AC Power Cord
Host System
RS-232 Cables (ECM25C), p. 83
System Printer
External Visual or Audible Alarm (not included)

NOTE: We can customize! Call Tech Support.

FAXBACK INFORMATION
Request Document Number: 13181
Call 412-746-5500 Anytime

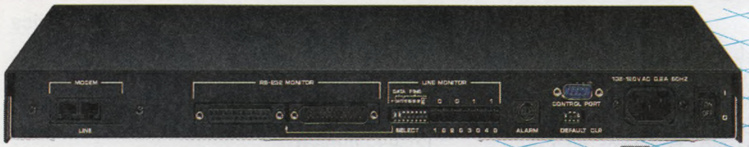
SPECIFICATIONS

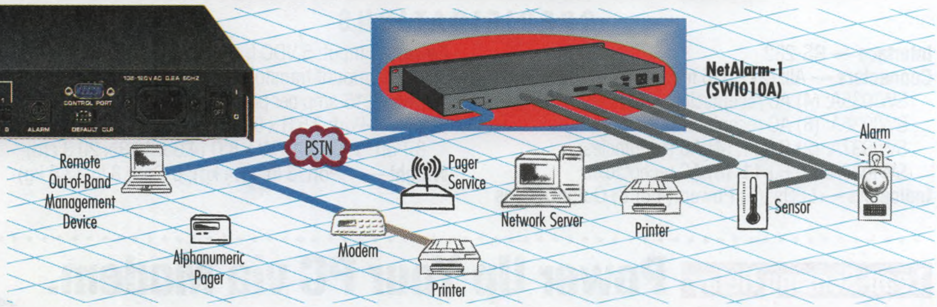
Switches — Data Reset; AC input power select
CE Approval — All items listed are approved
Interface — Parallel: Centronics®; Serial: RS-232 and RS-422
Connectors — (1) DB25 male, (1) DB25 female
Indicators — LEDs: (1) Power, (1) Output
Power — 115/230 VAC, 60/50 Hz, user-selectable
Size — 2.5"H x 8"W x 6.3"D (6.4 x 20.3 x 16 cm)
Weight — 2 lb. (0.9 kg)

Item	Code	Price
Data Alarms		
Parallel	SW706A	**$349.00**
RS-232 (Serial)	SW705A	**$349.00**
RS-422 (Serial)	SW707A	**$349.00**

* * *

NetAlarm-1 This Remote Sentry Detects and Reports Alarms via Modem or Pager.


MODEM
LINE
RS-232 MONITOR
LINE MONITOR
CONTROL PORT
ALARM
DEFAULT CLR


NetAlarm-1 (SWI010A)
PSTN
Remote Out-of-Band Management Device
Pager Service
Alarm
Network Server
Printer
Sensor
Alphanumeric Pager
Modem
Printer

- **Fully programmable for multiple alarm triggers—up to 16 ASCII text strings or 4 TTL/RS-232 signal inputs.**
- **Built-in V.22 bis (2400-bps) modem dials out during alarms to alert your modem or pager service.**

NetAlarm-1 stands guard 24 hours a day to monitor RS-232 or TTL hardware operations and to alert you and your support staff when something's wrong.

FAXBACK INFORMATION
Request Document Number: 15688
Call 412-746-5500 Anytime

Configure NetAlarm-1 locally or remotely with simple menu-driven commands. You define the alarm conditions: up to 16 32-character ASCII strings for RS-232 data or up to four high/low (or time-duration) hardware inputs for TTL devices. NetAlarm-1 even monitors for loss of input.

When an alarm is sensed, you decide how NetAlarm-1 sounds off. Set it up for an audible alarm to call numeric or alphanumeric pagers with a display of the site ID and alarm condition or to dial a remote PC/Printer workstation and output an alarm report.

SPECIFICATIONS

Speed — Command: 1200 bps to 19.2 Kbps; Monitor: 300 bps to 38.4 Kbps
Interface — RS-232
Connectors — (1) DB9 plus (1) DB25 plug, (4) TTL/RS-232; (1) 6-pin Mini DIN
Indicators — Input signal, modem, alarm, system
Power — 115/230 VAC, 60/50 Hz (switch-selectable)
Size — 1.75"H x 19"W x 6.5"D (4.4 x 48.3 x 16.5 cm)
Weight — 6 lb. (2.7 kg)

Item	Code	Price
NetAlarm-1		
AC Powered	SWI010A	**$695.00**

* * *

AutoRelay Switches Control External Equipment with This Data-Activated Relay Switch.

- **Great for alarm signaling.**
- **Can be customized for special codes or strings.**

AutoRelay Switches work with serial *or* parallel interfaces to monitor data. They can also generate self-test messages from their output ports.

We Can Custom Program!

SPECIFICATIONS

Interface — Parallel or serial
Connectors — (3) DB25 female, (1) six-screw terminal block
CE Approval — 230-VAC versions; SW712AE–SW713AE
Power — 115 VAC, 60 Hz, wallmount power supply
Size — 2"H x 8"W x 6.3"D (5.1 x 20.3 x 16 cm)
Weight — 3 lb. (1.4 kg)

FAXBACK INFORMATION
Request Document Number: 14340
Call 412-746-5500 Anytime

EXCLUSIVE
BLACK BOX (412) 746-5500
AutoRelay Switch
Reset
Copy/Pause

Item	Code	Price
AutoRelay Switches		
RS-232	SW712A	**$325.00**
Parallel	SW713A	**$325.00**

remember to order cables Parallel Printer Cables **See page 107.**
RS-232 Cable, 10-ft. (3.0-m) ECM25C-0010-MM **$23.95**
For other lengths and genders, see p. 83.

Port Manager Switches

Secure Out-of-Band Management Lets Managers *In*, Locks Intruders *Out!*

Password-Protected
BLACK BOX (412) 746-5500
CLEAR
SET
ACTIVITY
Port Manager Switch
RS232 PORTS
SETUP
FUSE
LINE

- Password protects dialup access to 8 or 16 RS-232 devices via management ports.
- Auto data/speed conversion supports fast modem links without parity/speed changes.
- Transmits AT Refresh command to an attached modem. Ensures that autoanswer is always on to receive *your* call.
- RAM buffer stores system alarms and error messages. No more "blind" troubleshooting when you dial in.
- Full password protection keeps out unauthorized users.
- Any-port to any-port switching.

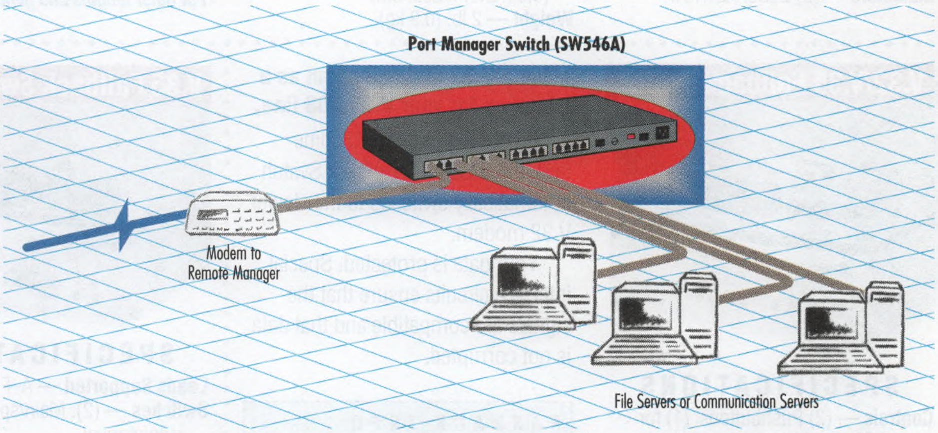
Open up remote hardware to network managers—*not* hackers—safely and securely with Port Manager Switches from the out-of-band experts: Black Box.

Choose 8- or 16-port models with AC or 48-VDC power supplies to support on-site management or dialup links to distant network devices. Control every router and channel bank at every branch office from the comfort of your own central office. At night, ring up remote modems to resolve network problems conveniently from a laptop at your home. Satisfy the password-access requirements (which *you* define), then get things back up and running—*without* leaving your home and with the peace of mind that nobody but *you* can access your vital network.

All ports on the Port Manager Switch are active simultaneously. This means you can, for instance, configure a remote bridge while still receiving information through other ports.

Configure the Port Manager Switch using simple commands from a terminal or PC using terminal-emulation software. Configuration and Status screens show activity for one or all ports. Save system configuration to disk for routine configuration or emergency backup. Even change configuration remotely via modem—you don't need to be on site to get your network up and running again. The Switch automatically transmits AT Refresh command to the attached modem so that autoanswer is always on to answer your call.

Port Manager Switches can be configured with 256K- or 512K-nonvolatile, dynamically allocated buffers which prevent data from being lost during power failure.


Port Manager Switch (SW546A)
Modem to Remote Manager
File Servers or Communication Servers

SPECIFICATIONS

Speed — 300 bps to 38.4 Kbps
CE Approval — Available (SW545AE, 230-VAC version)
Interface — RS-232
Connectors — (8) or (16) RJ-11 female
Indicators — (10) or (18) LEDs: Power, Ready, and (8) or (16) Port Activity
Power — 115/230 VAC, 60/50 Hz (switch-selectable)
Size — 1.8"H x 17"W x 6.5"D (4.5 x 43.2 x 16.5 cm)
Weight — 6 lb. (2.8 kg)

VIPreview
Ask for our
Server Management VIPreview.

Item	**Code**	**Price**
Port Manager Switches		
8-Port	SW545A	**$795.00**
16-Port	SW546A	**$995.00**
You may also need:		
Sportster® 33.6 Modem	000839-0	**$169.95**
Modular Adapter Kits DB25↔RJ-11		
Male	FA024	**$8.95**
Female	FA026	**$8.95**

FAXBACK INFORMATION
Request Document Number: 15671
Call 412-746-5500 Anytime

Complete Disaster Recovery.

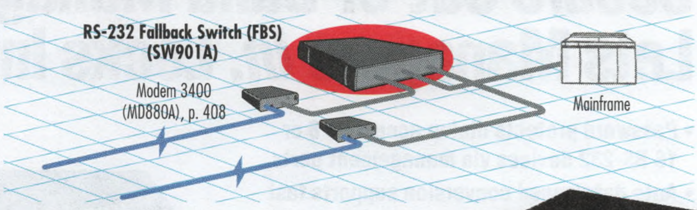
BLACK BOX® RS-232 and V.35 Fallback Switches Provide *Automatic* Backup.

RS-232 Fallback Switch (FBS)

- **Instantly detects lapses in the primary line, then switches to a backup line.**
- **Use it as a line sharer with automatic flow control.**

Keep leased-line failures from costing you time and money. The instant the Fallback Switch detects a lapse in the primary line, it switches your system to a backup line. As soon as signal is restored, it switches back to the primary line.

NOTE: All 12 required leads of the RS-232 interface for async or sync are switched.



SPECIFICATIONS

Leads Supported — 2–6, 8, 15, 17, 20–22, 24; 1 and 7 tied common
Switches — (1) 3-position mode selector
Interface — RS-232/V.24, synchronous or asynchronous
Indicators — (2) LEDs: ALT/PRI
Connectors — (3) DB25 female; master port is DCE, primary and alternate ports are DTE
Power — 115/230 VAC, 60/50 Hz (switch-selectable), 8 watts
Size — 2.3"H x 8.3"W x 11.5"D (5.8 x 21.1 x 29.2 cm)
Weight — 2 lb. (0.9 kg)

FAXBACK INFO
Request Document Number: 11110
Call 412-746-5500
Anytime

Item	Code	Price
RS-232 Fallback Switch (FBS)	SW901A	**$355.00**

remember to order **cables**

RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010-MM	**$23.95**

For other lengths and genders, see p. 83.

V.32/V.35 Fallback Switch

SPECIFICATIONS

Controls — (2) Pushbuttons: (1) for LED checking, (1) for Manual/Automatic operation selection; (1) Toggle for overriding automatic switching
Leads Supported — V.32/DB25: 2–6, 8, 13–25; V.35: A–F, H, J–L, P, R–Y, AA, BB, FF
Interface — V.35 and RS-32/V.24
Connectors — V.35: (2) 34-pin M-block female, 1 DCE, 1 DTE; V.32: (1) DB25 female DTE
Power — 115 VAC, 60 Hz
Size — 2"H x 7.3"W x 9.8"D (5.1 x 18.5 x 24.9 cm)
Weight — 4 lb. (1.8 kg)

> ***"When our primary leased line went down during an ice storm, your backup Switches saved us from a lot of grief."***

- **Use a V.32 dialup modem as a backup for your V.35 DDS line.**

If your high-speed V.35 line fails, the V.32/V.35 Fallback Switch automatically switches to the slower V.32 modem.

Your data is protected. Special interface circuits ensure that the signals are compatible and that data is not corrupted.

FAXBACK INFO
Request Document Number: 11110
Call 412-746-5500
Anytime

Item	Code	Price
V.32/V.35 Fallback Switch	SW109A	**$610.00**
You may also need...		
CSU/DSU MS (**p. 421**)	MT132A-R2	**$725.00**
Modem 325 (**p. 409**)	MD278A	**$695.00**

V.35 Fallback Switches

SPECIFICATIONS

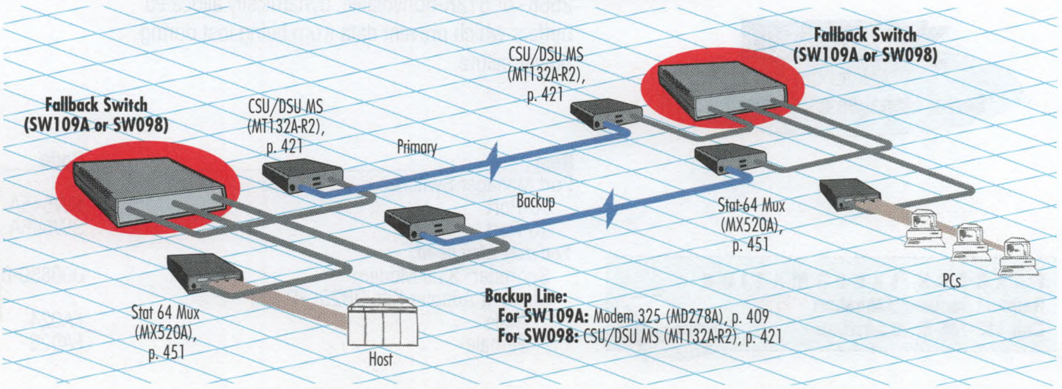
Leads Supported — A–F, H, P, R–Y, AA
Switches — (2): Main/spare, auto/manual
CE Approval — SW098C
Interface — V.35
Connectors — (3) V.35 female
Power — 115 VAC, 60 Hz
Size — 2"H x 7"W x 6"D (5.1 x 17.8 x 15.2 cm)
Weight — 3.6 lb. (1.6 kg)

FAXBACK INFO
Request Document Number: 10047
Call 412-746-5500
Anytime

- **Fall back to a second V.35 line.**

Keep your high-speed data link up and running at all times with a backup line and the V.35 Fallback Switch. The combination gives you fail-safe security. You never lose data because of a single line failure. Automatic mode protects you from "hair-trigger" switching, responding only to signals from the secondary line. A front-panel pushbutton switch gives you a manual override of the auto mode.

Item	Code	Price
V.35 Fallback Switches		
Standalone	SW098A	**$440.00**
Card	SW098C	**$405.00**
Fallback Switch Rack	RM018	**$460.00**
You may also need...		
CSU/DSU MS (**p. 421**)	MT132A-R2	**$725.00**

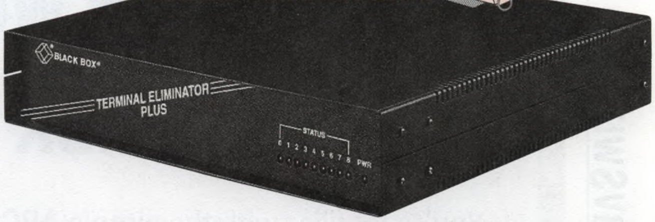


Terminal Eliminator Plus

Control up to Eight Devices from One Monitor Station.

- **One monitor/keyboard station controls and views activity on four to eight CPUs.**
- **Optional Memory Expansion doubles buffer capacity to 64 KB.**

FAXBACK INFORMATION
Request Document Number: 12283
Call 412-746-5500 Anytime



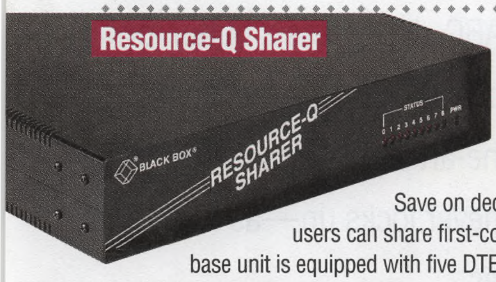
The BLACK BOX® Terminal Eliminator Plus ends the need for separate monitor consoles and keyboards for mainframes, data PBXs, or other hardware that logs data out of a serial port. Applications include error-messaging, data collection, and security-alarm monitoring.

The Terminal Eliminator Plus features five modes: Concentrate, Broadcast Only, Concentrate and Broadcast, Conversation, and Transparent Conversation.

SPECIFICATIONS

Operation — 4-wire full-duplex
Protocol — Asynchronous
Speed — 110 bps to 19.2 Kbps
CE Approval — TL482A-R3, TL483-C
Interface — RS-232, DTE or DCE
Indicators — (9) Port Activity, (1) PWR
Power — 115 VAC, 60 Hz
Size — 2.5"H x 12.1"W x 11.1"D (6.4 x 30.7 x 28.2 cm)
Weight — TL482A-R3: 6.6 lb. (3 kg);
TL483-C: 0.6 lb. (0.3 kg);
Power Supply: 2.1 lb. (0.9 kg)

Item	Code	Price
Terminal Eliminator Plus	TL482A-R3	**$750.00**
4-Port Expansion Board	TL483-C	**$360.00**
32K Memory Expansion	TL484	**$28.70**
Rackmount Bracket	TL486	**$25.00**



Resource-Q Sharer

Occasional Users Can Share Access to One Host Port.

- **Five DTE/DCE-configurable ports for five users to share access. Expandable to nine ports.**
- **Make more efficient use of your limited async host ports. (Rackmountable, too!)**

Save on dedicated async host ports! With Resource-Q Sharer, several users can share first-come, first-served access to your limited resources. The base unit is equipped with five DTE/DCE-configurable ports; the optional 4-Port Expansion Board adds four more.

Regular status updates show users where they are in the queue. They can drop out anytime. If users don't take their turn, Resource-Q Sharer drops them from the queue automatically.

FAXBACK INFORMATION
Request Document Number: 11866
Call 412-746-5500 Anytime

SPECIFICATIONS

Protocol — Asynchronous
Speed — Up to 19.2 Kbps
CE Approval — All items listed are approved
Interface — RS-232
Connectors — (5) or (9) DB25 female
Power — 115/230 VAC, 60/50 Hz
Size — 2.3"H x 12.1"W x 11.2"D (5.8 x 30.7 x 28.4 cm)
Weight — 8 lb. (3.6 kg)

Item	Code	Price
Resource-Q Sharer	TL251A	**$500.00**
4-Port Expansion Board	TL251C	**$180.00**
Rackmount Bracket	TL486	**$25.00**

Out-of-Band and Local: Server Management.

Manage your network servers from a single workstation—even if you mix IBM®, Macintosh®, and Sun® CPUs.

Manage up to 3000 network servers from outside your network—without using bandwidth or interfering with network traffic.

Manage your network servers economically—your budget will thank you.

BLACK BOX® ServSwitch technology makes it possible.

BLACK BOX
ServSwitch

Just turn the page for a look at our famous BLACK BOX® ServSwitch™ technology

Save with ServSwitches!
Let Black Box Show You How!

You're familiar with the simple ABC switch—it's used to connect several PCs to an office printer. With an ABC Switch, each PC doesn't need its own printer—they all share one office printer. And that saves money.

BLACK BOX® ServSwitches carry this "share and save" principle *into the '90s.* With a ServSwitch you can use one keyboard, monitor, and mouse with multiple CPUs. And you save BIG—because you don't need to buy a monitor for each CPU!

A BLACK BOX® ServSwitch is as easy to use as ABC. Just press a button or type keyboard commands to select another CPU. State-of-the-art electronics ensure that your keyboard never locks up—as it can with cheaper switches.

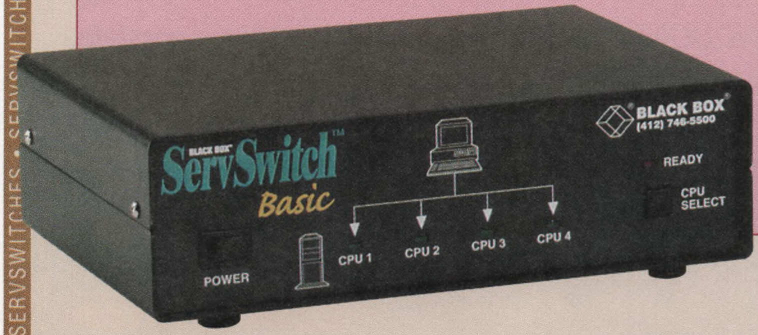
ServSwitch™ Cost Justification

Project: Manage my two computers more efficiently.

The "Old" Way:		**The Black Box Way:**	
Two 17" monitors @ $700	$1400	One 17" monitor	$700
Two keyboards @ $30	$60	One keyboard	$30
Two mice @ $35	$70	One mouse	$35
		One 2-port ServSwitch	$295
Total	**$1530**	**Total**	**$1060**

Save $470!

Plus—
- More shelf and desktop space
- Reduced cable clutter
- Convenient location



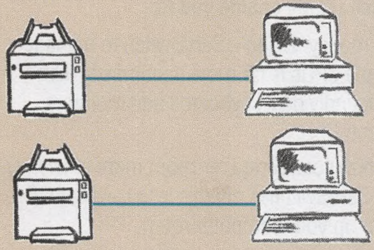
EXPERT TECHNICAL SUPPORT

24 HOURS A DAY
7 DAYS A WEEK
412-746-5500

Expert Technical Support—FREE!

BLACK BOX® ServSwitches Make Saving as Easy as ABC!

ABC Switch

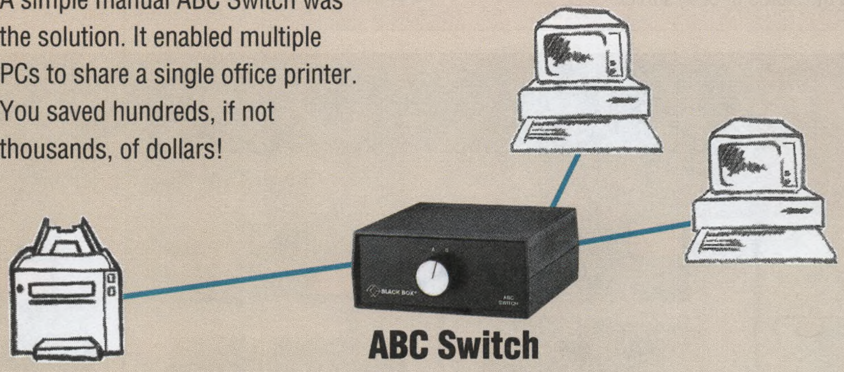


The Old Way: Before the ABC Switch.

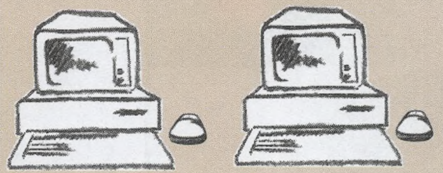
In order to print from different stations, you had the cost of dedicated printers for each PC. What a colossal expense!

The New Way: After the ABC Switch.

A simple manual ABC Switch was the solution. It enabled multiple PCs to share a single office printer. You saved hundreds, if not thousands, of dollars!



ServSwitch

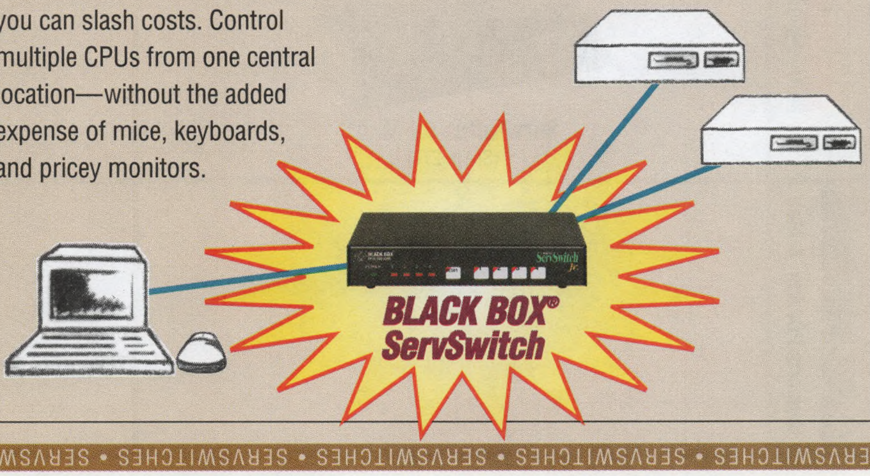


The Old Way: Before Your ServSwitch.

Now you have a similar problem: You want to add another computer—but a new mouse, keyboard, and monitor are incredibly expensive.

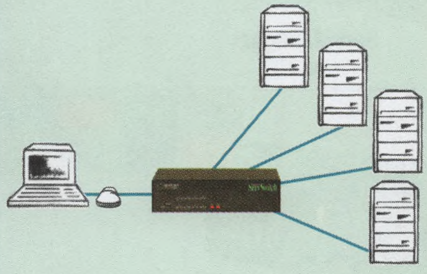
The New Way: After Your ServSwitch.

With a BLACK BOX® ServSwitch you can slash costs. Control multiple CPUs from one central location—without the added expense of mice, keyboards, and pricey monitors.



BLACK BOX ServSwitch™ technology

BLACK BOX® ServSwitches manage more than CPUs—they also manage your servers and data centers!



A ServSwitch for Every Application.

All members of the BLACK BOX® ServSwitch family enable you to:

- Access two or more CPUs from a single workstation.
- Manage multiple Servers from outside your network without using bandwidth or interfering with network traffic.
- Reboot all your servers simultaneously after a power outage—other switches make you reboot each server individually.
- Select Servers from front-panel buttons or by sending an easy keyboard command.
- See the status of each server.
- Save money. Using a ServSwitch to manage multiple CPUs is far more economical than buying individual keyboards and monitors for each CPU.
- Organize your computer room more efficiently. With ServSwitches, there's less hardware to clutter up your computer room.

And all these features are only the beginning of the ServSwitch story. Just check out the chart **below** to see the wide range of capabilities available with BLACK BOX® ServSwitches!

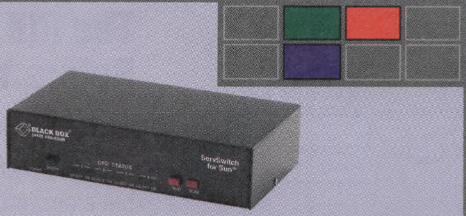
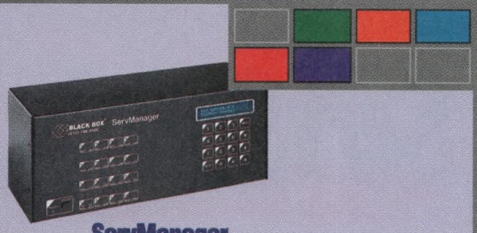
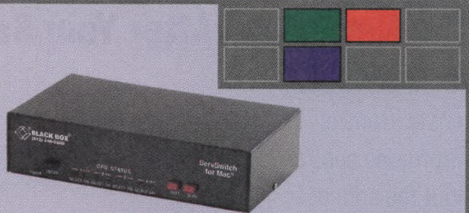
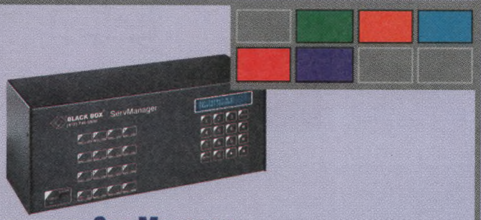
ServSwitch™ technology

Use the chart to select your ServSwitch.

1. Select a Single-User or Multi-User ServSwitch (read the Black Box Explains on **page 273**).
2. Find your computer platform, then identify which ServSwitches are compatible.
3. Each ServSwitch has a color-coded legend describing product features. See **pages 276–283** for complete descriptions to help you select the right model.

Single-User

Standard ServSwitch Controls

PLATFORMS				
PC	**ServSwitch Basic** (See **p. 276**)	**ServSwitch Jr.** (See **p. 276**)	**ServSwitch for PC** (See **p. 277**)	**ServManager** (See **p. 278**)
Sun	 **ServSwitch for Sun®** (See **p. 277**)		 **ServManager** (See **p. 278**)	
Mac®	 **ServSwitch for Mac®** (See **p. 277**)		**ServManager** (See **p. 278**)	
Multi-Platform Supports PC, Sun, & Mac			 **ServManager** (See **p. 278**)	

In This Section...
Manual
Ganged

Black Box Explains…

Single-User and Multi-User ServSwitches.

Single-User ServSwitches enable one workstation to control multiple CPUs.

Multi-User ServSwitches give two or more workstations access to multiple CPUs or servers. If your application requires more than one person to control multiple CPUs or servers, consider Multi-User ServSwitches.

Multiplatform ServSwitches.

Single-platform ServSwitches enable you to control PC, Mac, *or* Sun CPUs. Multiplatform ServSwitches, however, enable you to control *a mixture* of PC, Mac, *and* Sun CPUs.

Legend for Color-Coded Features.

FEATURES LEGEND

🟧 Up to 10 Feet	🟩 Up to 200 Feet	🟥 Daisy-Chainable	🟦 Flash-ROM Upgradable
🟥 Mouse Conversion	🟪 Keyboard/ Mouse Reset	🟫 On-Screen Menus	🟥 Modular Expansion

For more details about these features, see **pages 274–275.**

Plus On-Screen Menus

🟧⬜🟥⬜
🟥🟪🟫⬜

ServSelect
(See **p. 279**)

⬜🟩🟥🟦
🟥🟪🟫⬜

ServSwitch Ultra for PC
(See **p. 280**)

⬜🟩🟥🟦
⬜🟪🟫⬜

ServSwitch Ultra for Sun
(See **p. 280**)

⬜🟩🟥🟦
⬜🟪🟫⬜

ServSwitch Ultra Multi
(See **p. 280**)

⬜🟩🟥🟦
⬜🟪🟫⬜

ServSwitch Ultra Multi
(See **p. 280**)

Multi-User

Standard ServSwitch Controls

⬜🟩🟥⬜
🟥🟪⬜⬜

Matrix ServSwitch
(See **p. 281**)

⬜🟩🟥⬜
🟥🟪⬜⬜

ServMaster
(See **p. 281**)

Confused about the Best ServSwitch for Your Needs?

Give our Expert Technical Support Staff a call and they'll point you in the right direction. Plus, they're available 24 hours a day, 7 days a week so you can reach them whenever *you* need them.
Just call **412-746-5500**.

TECH SUPPORT
OUR BEST PRODUCT!

Plus On-Screen Menus

🟧⬜🟥🟦
🟥🟪🟫🟥

ServSwitch Multi
(See **pp. 282–283**)

🟧⬜🟥🟦
🟥🟪🟫🟥

ServSwitch Multi
(See **pp. 282–283**)

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ServSwitch Multi
(See **pp. 282–283**)

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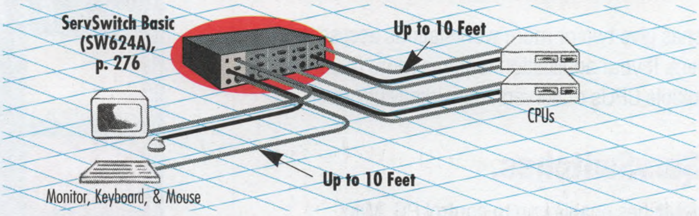
ServSwitch Multi
(See **pp. 282–283**)

ServSwitch Features and

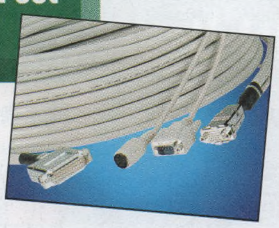
Up to 10 Feet

Up to 10 Feet

- Connect your CPUs and workstation up to 10 feet away from the Switch.



Up to 200 Feet



Up to 200 Feet

- Use coax cable to connect your CPUs and workstation up to 100 feet away from your Switch!
- Combine coax cable with our Station Extenders (see **page 286**) to get up to 200 feet total distance.
- Ensure high-resolution video quality.
- Use a single cable to carry keyboard, monitor, and mouse signals to each workstation—a tremendous money-saver!

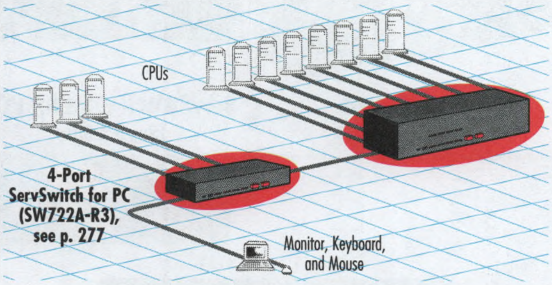
Coax ServSwitch Cable: Notice the single connector at the left that attaches to the switch and the individual connectors for the keyboard, monitor, and mouse to the right.

Daisychainable

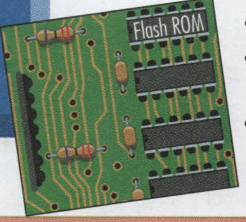
Daisychainable

- In order to add more CPUs, ServSwitches can be connected together.
- Daisychainable ServSwitches will always keep pace with your expanding network.

By connecting a 4-Port and an 8-Port ServSwitch, one workstation can control 11 CPUs.



Flash-ROM Upgradable



Flash-ROM Upgradable

- Flash ROM makes it easy to upgrade your ServSwitch.
- ServSwitches are "obsolescence-proof." When a new CPU model is released, just upgrade your ServSwitch's Flash-ROM memory chip.
- Your ServSwitch will always be compatible with new technologies—from PCs to servers!

TECH SUPPORT
OUR BEST PRODUCT!

Why Buy from Black Box?

Recognize any of these situations?

- You wait more than 30 minutes to get through to a vendor's tech support.
- The so-called "tech" can't help you or gives you the wrong answer.
- You don't have a purchase order number and the tech refuses to help you.
- It's 9 P. M. and you need help, but your vendor's tech support line is closed.
- You get a bad feeling when you call a vendor and the hold music starts playing "Rescue Me."

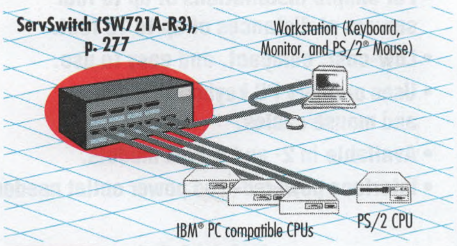
According to a recent survey by *Data Communications* magazine, 90 percent

What They Mean:

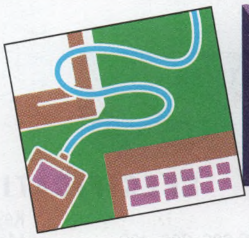
Mouse Conversion

Mouse Conversion

- A PS/2® mouse can be used to control CPUs with either PS/2 or serial mouse connections.
- Enables CPUs with different mouse ports to be used without expensive upgrades.
- For total versatility, the ServSwitch Ultra (**page 280**) and ServManager (**page 278**) work with either a serial or a PS/2 mouse to control a mix of PCs with serial mouse ports as well as PS/2 computers.


ServSwitch (SW721A-R3), p. 277
Workstation (Keyboard, Monitor, and PS/2® Mouse)
IBM® PC compatible CPUs
PS/2 CPU

Keyboard/Mouse Reset



Keyboard/ Mouse Reset

- Keyboards and mice may periodically lock up.
- This feature enables the mouse and keyboard to be reset without having to reboot the CPU.
- Downtime is kept to a minimum!

On-Screen Menus

On-Screen Menus

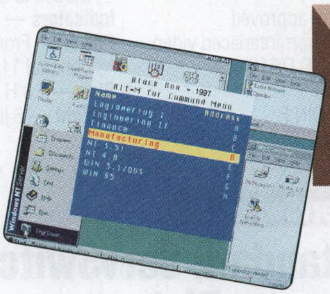
Easy-to-read, easy-to-use menus enable you to:

- Configure CPU, keyboard, and mouse types.
- Position the menu window anywhere on screen.

For larger systems, you can:

- Give each CPU a name that makes sense to you.
- Identify and select CPUs quickly and easily.

ServSwitches with on-screen menus also offer you the same switching options as all our ServSwitches: front-panel pushbuttons and command sequences from the keyboard.



```
Black Box - 1997
Alt-M for Command Menu
Name                          Address
Engineering I                    A
Engineering II                   B
Finance                          C
Manufacturing                    D
NT 3.51                          E
NT 4.0                           F
WIN 3.1/DOS                      G
WIN 95                           H
```

Modular Expansion

Modular Expansion

- Modular expansion gives you the ultimate in growth potential and versatility.
- To add workstations or CPUs, just slide in another module!
- Modules are all hot swappable—add or change modules without shutting down the Switch!

Exceptional Value. Exceptional Tech Support. Period.

of network managers surveyed say that getting the technical support they need is extremely important when choosing a vendor. But even though network managers pay anywhere from 10 to 20 percent of their overall purchase price for a basic service and support contract, the technical support and service they receive falls far short of their expectations—and certainly isn't worth the $10,000–$100,000 they paid.

At Black Box, you'll *never* have these experiences. In fact, we guarantee the best value and the best support. You can even consult our Technical Support Experts *before* you buy if you need help selecting just the right component for your application.

Don't waste time and money—call Black Box today!

PC

ServSwitch Basic

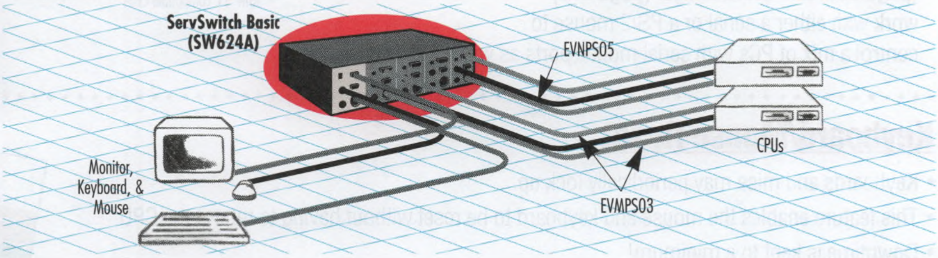
Basic Switching for Short Distances.

New

ServSwitch Basic
BLACK BOX (412) 746-5500
READY
CPU SELECT
POWER
CPU 1
CPU 2
CPU 3
CPU 4

- **For simple installations of up to four servers at distances of up to 10 feet.**
- **Low-cost, compact, and easy to use.**
- **Uses ordinary PC keyboard, video, and mouse cables.**
- **Available in 2- and 4-Port models.**
- **Interface powered—no power outlet needed.**

The ServSwitch Basic is a basic cost-effective ServSwitch ideally suited for short-range small-office applications. And because it uses ordinary PC keyboard, video, and mouse cables rather than standard ServSwitch cabling, you can economize by using the cables you probably already have on hand.



FAXBACK INFORMATION
Request Document Number: 18681
Call 412-746-5500 Anytime

SPECIFICATIONS

Distance — 6.6 ft. (2 m)

Supported CPUs — IBM® PS/2®; PC 286, 386, 486, Pentium® or compatible

CE Approved — All items listed are approved

Video — VGA, up to 1600 x 1280 non-interlaced video

Connectors — Monitor from PC: HD DB15M; Monitor from Switch: HD DB15F; Keyboard from PC: 6-Pin Mini DIN F; Keyboard to Switch: 6-pin Mini DIN F; Mouse from PC: 6-Pin Mini DIN F; Mouse to Switch: 6-Pin Mini DIN F

Indicators — LEDs: (1) Power

Power — From the interface; optional 115-VAC power supply available

Size — 1.3"H x 5.4"W x 4"D (3.4 x 13.7 x 10.3 cm)

Weight — 6 lb. (2.7 kg)

Item	Code	Price
ServSwitch Basic		
2-Port	SW623A	**$295.00**
4-Port	SW624A	**$395.00**
remember to order cables 6-Pin Mini DIN Cable, 6-ft. (1.8-m) Male/Male	EVMPS03-0006-MM	**$23.95**
For other lengths or genders, see p. 92.		
VGA Video Extension Cable, 10-ft. (3.0-m) Male/Male	EVNPS05-0010-MM	**$34.95**
	For other lengths or genders, see p. 91.	

◆ ◆ ◆

PC

ServSwitch Jr.

Standard ServSwitch Cabling for Extra Convenience and Longer Distances.

- **Similar to the ServSwitch Basic,** ***plus:***
- **Standard ServSwitch cabling for convenient setup and up to 100 feet of distance.**
- **PS/2 mouse conversion.**
- **Keyboard/mouse reset.**

New

BLACK BOX
(412) 746-5500
POWER
1
2
3
4
RESET
1
2
3
4
ServSwitch Jr.

The ServSwitch Jr. has many of the same great features as our classic ServSwitch. The primary difference between the ServSwitch Basic and the ServSwitch Jr. is that the ServSwitch Jr. uses standard ServSwitch cabling.

This cabling is easy to use because there's only one cable needed between the Switch and each CPU. Plus you get up to 100 feet of distance that can be extended to 200 feet with our Station Extenders on **page 286**.

FAXBACK INFORMATION
Request Document Number: 18306
Call 412-746-5500 Anytime

SPECIFICATIONS

Distance — Cable length: Up to 19.6 ft. (6 m); With coax cable: Up to 100 ft. (30.5 meters)

Supported CPUs — IBM PS/2; PC 286, 386, 486, Pentium or compatible

Video — VGA, up to 1600 x 1280 non-interlaced video

CE Approved — All items listed are approved

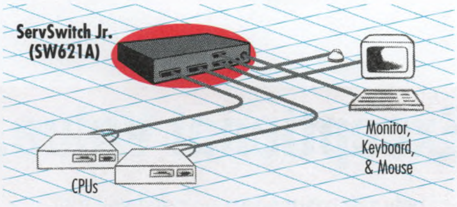
Connectors — Computers: DB25F; VGA Monitor: HD15M; RS-232 mouse: DB9M; PS/2 mouse: 6-Pin Mini-DIN; PS/2 Keyboard: 6-Pin Mini-DIN F; AT® Keyboard: 5-Pin DIN F

Indicators — LEDs: (1) Power, (2) or (4) Select, (2) or (4) CPU Power

Power — From the interface

Size — 1.8"H x 8.9"W x 3.4"D (4.4 x 22.6 x 8.6 cm)

Weight — 3 lb. (1.4 kg)



Item	Code	Price
ServSwitch Jr.		
2-Port	SW621A	**$325.00**
4-Port	SW622A	**$425.00**
remember to order cables CPU/Server to ServSwitch Cable, 10-ft. (3.0-m)	EHN051-0010	**$63.95**
	For other lengths, see p. 284.	

PC Sun® Mac®

New
SERVSWITCH
ServSwitch™
BLACK BOX® (412) 746-5500

ServSwitch

Our Original ServSwitch Is Still the Best for Many Applications.

- **All the functionality of our ServSwitch Jr.,** ***plus:***
- **Up to 16 ports.**
- **Compact chassis and flash ROM.**

ServSwitch for PC

The classic BLACK BOX® ServSwitch—still the first choice for most server management applications—is one of our most popular products. And now we've made it even better.

BLACK BOX® ServSwitches now occupy less rack space. Two- and four-port units are now 1.75" high (one rack unit), eight-, twelve-, and sixteen-port versions are 3.5" high. Rackmount kits are available.

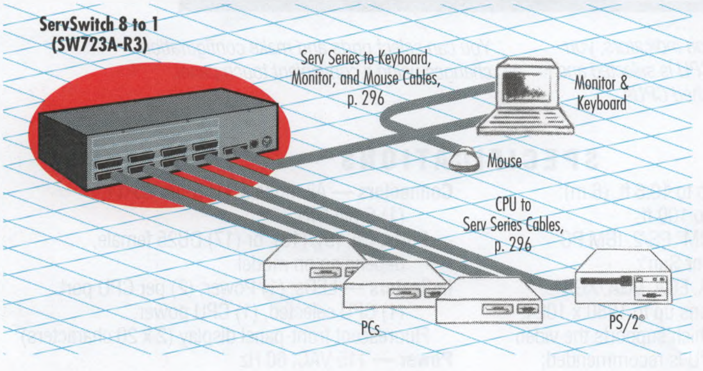
Flash ROM enables future upgrades. When new technology is introduced, the ServSwitch can be upgraded to stay compatible.

Add our Station Overlay Option Board (**page 286**) for great on-screen menus similar to those of our ServSelect on **page 279**. To expand your 8-Port or 12-Port ServSwitch to 12 or 16 ports, we offer a 4-Port Expansion Card—which we'll install free.

ServSwitch for Mac and ServSwitch for Sun

The popular BLACK BOX® ServSwitch comes in Mac® and Sun® models, too. They're available with two or four ports and do not include flash ROM. Rackmount kits are available.

TECH SUPPORT'S PRODUCT OF CHOICE


ServSwitch 8 to 1
(SW723A-R3)
Serv Series to Keyboard, Monitor, and Mouse Cables, p. 296
Monitor & Keyboard
Mouse
CPU to Serv Series Cables, p. 296
PCs
PS/2®

SPECIFICATIONS

Distance — All models: Up to 100 ft. (30.5 m) using coax cable;
PC models only: Up to 19.6 ft. (6 m) using standard ServSwitch cable

System Requirements — KV3104FA, KV3108SA, SW721A-R3–SW725A-R3: IBM® PC/AT®, PS/2, or compatible; Video: Monochrome, CGA, EGA, or VGA; Mouse: PC or PS/2;
SW714A–SW715A: Mac video up to 1280 x 1024;
SW754A–SW755A: Sun video up to 1280 x 1024

CE Approval — 230-VAC versions

Connectors — All: (1) 6-pin RJ-11, (1) 5-pin DIN;
SW721A-R3, SW714A, SW754A: (3) DB25 female;
SW722A-R3, KV3104FA, SW715A, SW755A: (5) DB25 female;
SW723A-R3, KV3108SA: (9) DB25 female;
SW724A-R3: (13) DB25 female;
SW725A-R3: (17) DB25 female

Indicators — LEDs: (1) Power, (2) for every CPU port: (1) CPU selected, (1) CPU power

Power — 115 VAC, 60 Hz (230-VAC, 50-Hz version on request)

remember to order cables
Cables for your ServSwitch, **see pp. 284–285.**

FAXBACK INFORMATION
For ServSwitches for PC: 11990,
For ServSwitches for Mac: 16603,
For ServSwitches for Sun: 16610,
Call 412-746-5500 Anytime

*NOTE: For mixed-platform applications, see our ServManager on **page 278**, ServSwitch Ultra Multi on **page 280**, or the ServSwitch Multi on **pages 282–283**.*

NEW SERVSWITCH CHASSIS OPTIONS

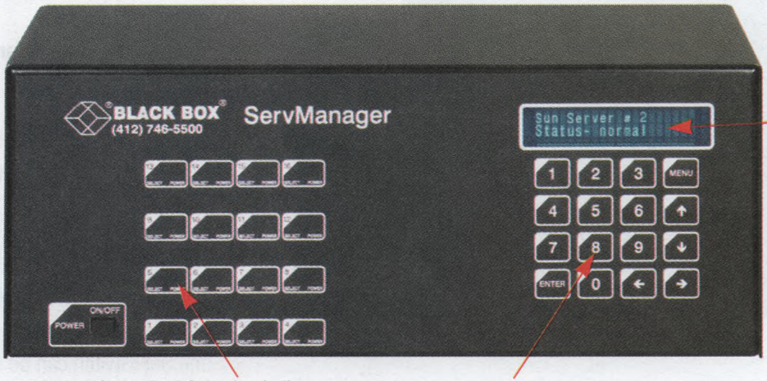
Platform/Chassis Styles		Expansion Capacity	Number of Ports	Code	Price
PC	**Mini**—8.9" x 1.75" (1 RU)	None	2 4	SW721A-R3 SW722A-R3	**$595.00** **$695.00**
PC	**Slim**—13.5" x 1.75" (1 RU)	Up to 8 CPU/Servers	8	KV3108SA	**$1145.00**
PC	**Full**—13.5" x 3.5" (2 RU)	Up to 16 CPU/Servers	4 8 12 16	KV3104FA SW723A-R3 SW724A-R3 SW725A-R3	**$795.00** **$1195.00** **$1695.00** **$2245.00**
Sun®	**Classic**—8.8" x 2.3"	None None	2 4	SW754A SW755A	**$695.00** **$795.00**
Mac®	**Classic**—8.8" x 2.3"	None None	2 4	SW714A SW715A	**$595.00** **$695.00**

Multi-Platform
Supports PC, Sun, & Mac

ServManager

Manage *Any* Combination of PC, Sun, or Mac from One Location.

- **Control PCs and Sun and Mac CPUs from one workstation.**
- **Keypad and alphanumeric display enable users to define and display a name for each CPU.**
- **An easy-to-read bright-blue vacuum-fluorescent alphanumeric display shows the name, port number, and status of the selected CPU.**
- **Flash EPROM for future compatibility.**



Bright-blue vacuum-fluorescent alphanumeric display shows name, port number, and status of correctly selected CPU.

With the Status and Selection indicators, you can see at a glance which CPU is selected and the power status of all attached CPUs.

You can select ports and make configuration changes using a convenient touch panel.

Control all your IBM® PC, Mac®, and Sun® servers or CPUs via a single keyboard, monitor, and mouse. And you can monitor the CPU currently under control using the ServManager's alphanumeric display. For at-a-glance viewing, just check the front panel where the port numbers and your own names for each connected CPU are displayed.

With the 16-key keypad and built-in alphanumeric display, you configure the number of ports, CPU type, and scan time directly from the ServManager.

As with all our ServSwitches, you can switch from the front-panel keypad, keyboard commands, or the RS-232 serial port.

The ServManager also supports many SGI, DEC™ Alpha, and RS/6000 models. For more information or any questions you have about this feature-rich product, please call Tech Support at **412-746-5500**. They'll be glad to help you with the right configuration for your application.

FAXBACK INFORMATION
Request Document Number: 14766
Call 412-746-5500 Anytime

*NOTE: If you're connecting a ServManager to a ServManager, order **EHN055** or **EHN274** Cable. **EHN274** is available in lengths up to 100 feet; See **page 284**.*

remember to order cables
Cables for your ServManager, **see p. 285.**

SPECIFICATIONS

Distance — Cable length: Up to 19.6 ft. (6 m); VGA with coax cable, up to 100 ft.

System Requirements — IBM® PS/2, IBM PC (286 or greater), Mac® or Sun®;
Video: Monochrome, CGA, EGA, VGA, XGA®, Mac, and Sun resolutions up to 1280 x 1024; a multisync monitor which supports the video standard from each CPU is recommended;
Mouse: Sun mouse is recommended if Sun CPUs are being shared; PC mouse is recommended for Macintosh and PC sharing

CE Approval — 230 VAC versions: SW995AE–SW998AE

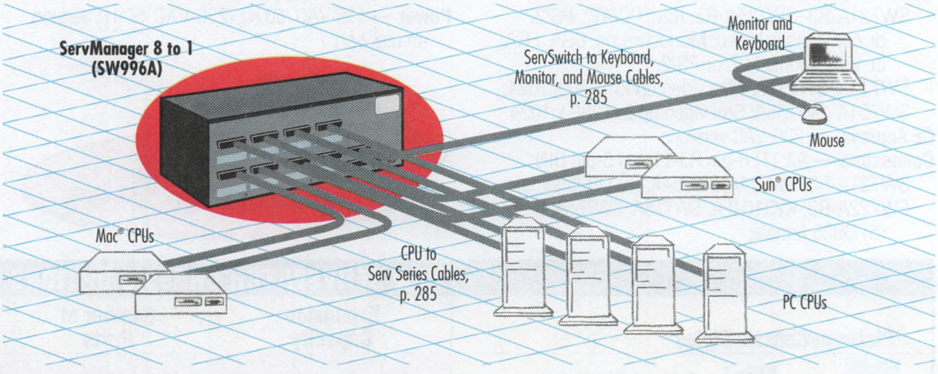
Connectors — All models: (1) 6-pin RJ-11, (1) 5-pin DIN;
Ports: (5), (9), (13), or (17) DB25 female, depending on model

Indicators — LEDs: (1) Power; (2) per CPU port: (1) CPU selected, (1) CPU power;
Fluorescent front-panel display (2 x 20 characters)

Power — 115 VAC, 60 Hz

Size — SW995A–SW998A: 5.5"H x 13.5"W x 5"D (14 x 34.3 x 12.7 cm)

Weight — SW995A–SW998A: 12 lb. (5.4 kg)


ServManager 8 to 1
(SW996A)
Monitor and Keyboard
ServSwitch to Keyboard, Monitor, and Mouse Cables, p. 285
Mouse
Sun® CPUs
Mac® CPUs
CPU to Serv Series Cables, p. 285
PC CPUs

Item		Code	Price
ServManager	4 to 1	SW995A-R2	**$945.00**
	8 to 1	SW996A-R2	**$1345.00**
	12 to 1	SW997A-R2	**$1845.00**
	16 to 1	SW998A-R2	**$2345.00**
ServSwitch Accessories			
4-Port Expansion Card (Please call Tech Support for installation recommendations.)		KV5000C	**$600.00**
19" Rackmount Kit	for SW995A	SW727	**$60.00**
19" Rackmount Kit	for SW996A–998A	SW728	**$60.00**
ServSwitch-to-ServSwitch Expansion Cable		EHN274-0005	**$92.50**
		EHN274-0010	**$105.00**

remember to order cables

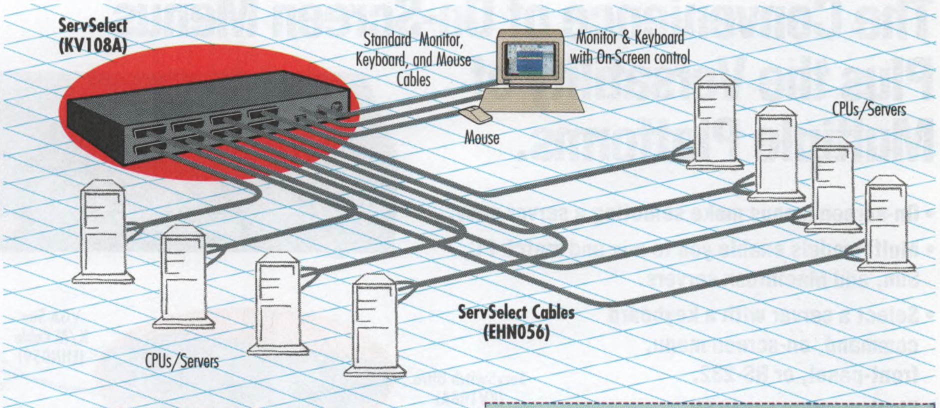
PC

On-Screen Menus

ServSelect

On-Screen Menus Make This ServSwitch Even Easier to Use!

- **On-screen menu makes switching easy.**
- **Compact space-saving design.**
- **Daisychain Switches to support up to 64 servers.**


ServSelect (KV108A)
Standard Monitor, Keyboard, and Mouse Cables
Monitor & Keyboard with On-Screen control
CPUs/Servers
Mouse
ServSelect Cables (EHN056)
CPUs/Servers

FAXBACK INFORMATION
Request Document Number: 17862
Call 412-746-5500 Anytime

BLACK BOX (412) 746-5500
A
B
C
D
E
F
G
H
STEP/SCAN
STATUS
ServSelect

We've taken our famous ServSwitch and made it friendlier and easier to use. First we trimmed it down to a sleek, slim shape that fits neatly under your PC or into a 19" rack. Then we gave it an easy-to-use menu that pops up on your PC screen and we put that menu on a ROM chip so there's no problem of incompatibility with your software. And to top it off, we've made it very affordable.

The ServSelect Is Loaded with Features:

Built-In Menu System

Configure and control your ServSelect from a menu that pops up on your monitor. Because you can name each server individually, you don't need to remember which CPU is "Server A" and which is "Server B." You give your servers names of up to 14 characters—names that make sense to you: Finance, MIS, or Marketing.

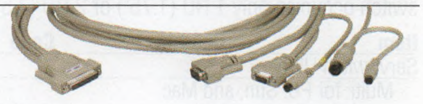
Plus, ServSelect offers you the same switching options as our traditional ServSwitches: easy front-panel pushbuttons and command sequences from the keyboard.

A single ServSelect supports up to eight CPUs (servers) on a single keyboard, monitor, and mouse. If your installation grows, you can add up to eight more Switches for a total of 64 CPUs.

SPECIFICATIONS

Peripherals — PS/2® style keyboard and mouse
Supported CPUs — IBM® PC, PS/2 and compatibles
Video — VGA, SVGA, XGA®, XGA II; maximum resolution: 1280 x 1024 at 60 Hz
CE Approval — All items listed are approved
Connectors — (4) or (8) DB25 male, (2) 6-pin mini DIN female, (1) HD DB15, (1) DB9 female, (1) IEC 320;
ServSelect Cable: (1) DB25 female, (1) HD DB15 male, (1) DB9 female, (1) 6-pin mini DIN male, (1) 5-pin DIN male, (1) 6-pin mini DIN male
Power — 100–240 VAC, 60–50 Hz, autosensing
Size — 1.7"H x 17.2"W x 8.5"D (4.5 x 43.7 x 21.6 cm)
Weight — 6.3 lb. (2.9 kg)

Item	**Code**	**Price**
ServSelect		
4-Port	KV104A	**$895.00**
8-Port	KV108A	**$1245.00**
remember to order cables — ***For ServSelect to CPU connections...***		
ServSelect Cables		
6-ft. (1.8-m)	EHN056-0006	**$45.95**
8-ft. (2.4-m)	EHN056-0008	**$62.95**
15-ft. (4.5-m)	EHN056-0015	**$87.00**
30-ft. (9.1-m)	EHN056-0030	**$133.00**



PC

ServSwitch Bus Mouse

Compatible with Bus Mice.

- The solution when a standard PS/2 or RS-232 style mouse interface isn't available.
- Gives the ServSwitch the ability to switch from the keyboard, front panel, or RS-232 serial port.
- Automatic booting of IBM compatible CPUs.

BLACK BOX (412) 746-5500
ServSwitch BusM

SPECIFICATIONS

CE Approval — Available
Connectors — (1) 5-pin DIN for power; (1) 6-pin RJ-11 for RS-232; (1) DB25 female for bus mouse; (1) DB25 female for keyboard and monitor; (4), (8), or (16) DB25 female for CPU depending on model

FAXBACK INFORMATION
Request Document Number: 14285
Call 412-746-5500 Anytime

Item	**Code**	**Price**
ServSwitch Bus Mouse		
2 to 1	SW737A	**$1195.00**
4 to 1	SW738A	**$1395.00**
8 to 1	SW739A	**$2490.00**

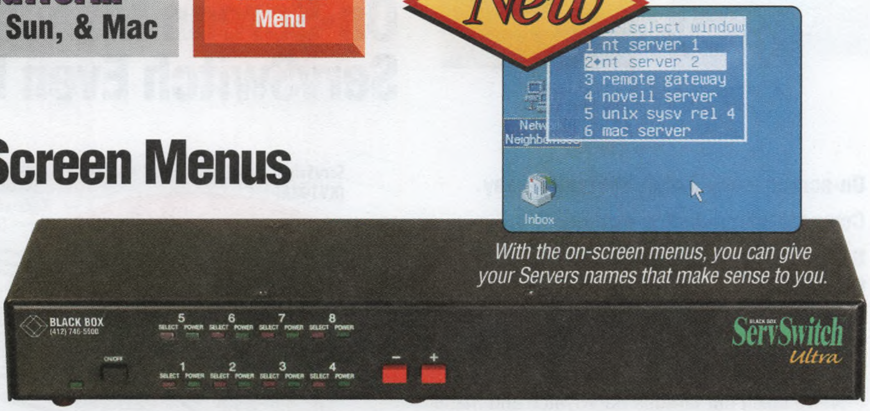
remember to order cables		
VGA/AT® Monitor and Keyboard Cable		
1-ft. (0.3-m)	EHN260-0001	**$27.50**
VGA/PS/2 CPU Cable		
5-ft. (1.5-m)	EHN261-0005	**$32.50**
10-ft. (3.0-m)	EHN261-0010	**$42.50**
20-ft. (6.1-m)	EHN261-0020	**$67.50**
VGA/PS/2 Monitor and Keyboard Cable		
1-ft. (0.3-m)	EHN262-0001	**$27.50**
VGA/PS/2 CPU Cable		
5-ft. (1.5-m)	EHN263-0005	**$32.50**
10-ft. (3.0-m)	EHN263-0010	**$42.50**
20-ft. (6.1-m)	EHN263-0020	**$62.50**
Bus Mouse Cable		
1-ft. (0.3-m)	EHN264-0001	**$27.50**
Bus Mouse CPU Cable		
5-ft. (1.5-m)	EHN265-0005	**$42.50**
10-ft. (3.0-m)	EHN265-0010	**$57.50**
20-ft. (6.1-m)	EHN265-0020	**$87.50**

PC | Sun® | Multi-Platform Supports PC, Sun, & Mac | On-Screen Menu | New

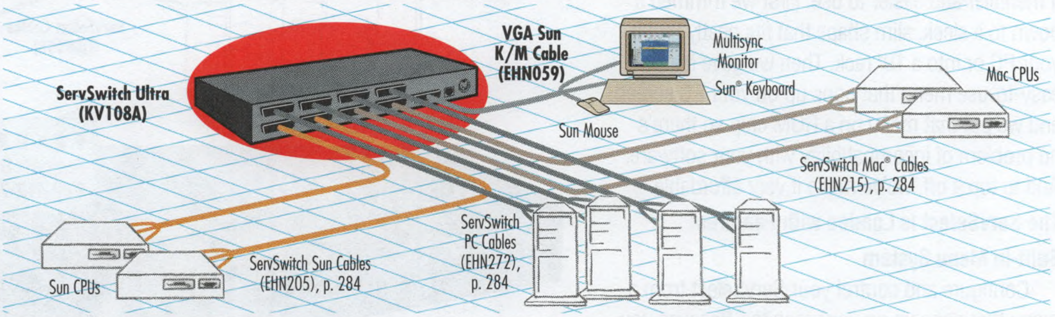
ServSwitch Ultra

The Convenience of On-Screen Menus Plus the Versatility of Multiple Platforms.

- On-screen menus make selecting a server easy.
- Multi models enable you to mix and match PC, Sun, and Macintosh servers.
- Select a server with a keyboard command, on-screen menu, front-panel, or RS-232.
- Flash memory saves all programmable settings and is updatable through the serial port.


select window
1 nt server 1
2•nt server 2
3 remote gateway
4 novell server
5 unix sysv rel 4
6 mac server
Network Neighborhood
Inbox
BLACK BOX
ServSwitch Ultra

With the on-screen menus, you can give your Servers names that make sense to you.


ServSwitch Ultra (KV108A)
VGA Sun K/M Cable (EHN059)
Multisync Monitor
Sun® Keyboard
Sun Mouse
Mac CPUs
ServSwitch Mac® Cables (EHN215), p. 284
ServSwitch PC Cables (EHN272), p. 284
ServSwitch Sun Cables (EHN205), p. 284
Sun CPUs

The ServSwitch Ultra gives you the ease and convenience of switching between servers with on-screen menus—you can even give your servers names that make sense to you. Plus, the Multi models are compatible with PC, Sun®, *and* Mac®. You can even mix all three platforms in a single installation.

Adaptability

The ServSwitch Ultra grows with your installation. 12-port units can be expanded to 16 ports. When you add more servers, you can daisychain the ServSwitch Ultra for a total of up to 256 servers.

Versatility

There's a ServSwitch Ultra to fit every installation. The Switch is available in 2-, 4-, 8-, 12, and 16-port models. And Rackmount kits make it easy to keep multiple Switches neatly racked in your computer room—each slim switch occupies only 1 RU (1.75") or 2 RU (3.5").

SPECIFICATIONS

Distance — Cable Length: Up to 19.6 ft. (6 m); VGA with Coax Cable: Up to 100 ft.

Supported CPUs — PS/2®, IBM® PC 286, 386, 486, Pentium® or compatible, Macintosh, Sun

Video — All PC, Macintosh, and Sun video up to 1600 x 1280 non-interlaced video; Monitor used must support desired video resolution

CE Approval — 230-VAC versions: Are available

Connectors — (1) RJ-11 6-wire; (1) 5-pin DIN F; (3, 5, 9, 13, or 17) DB25 F

Indicators — LEDs: (1) Power, (4) or (8) Select, (4) or (8) CPU Power

Power — 115-VAC, 60-Hz external power supply (230-VAC, 50-Hz version on request)

Size — Mini: 1.75"H x 8.9"W x 4.8"D (4.4 x 22.6 x 12.2 cm); Slim: 1.75"H x 13.8"W x 4.8"D (4.4 x 35 x 12.2 cm); Full: 3.5"H x 13.8"W x 4.8"D (8.9 x 35 x 12.2 cm)

Item	Chassis	Code	Price
ServSwitch Ultra			
Multi: for PC, Sun, and Mac			
2-Port	Mini	KV5002MA	**$895.00**
4-Port	Mini	KV5004MA	**$1195.00**
8-Port	Slim	KV5008SA	**$1695.00**
12-Port	Full	KV5012FA	**$2195.00**
16-Port	Full	KV5016FA	**$2695.00**
For PC Only			
2-Port	Mini	KV5102MA	**$725.00**
4-Port	Mini	KV5104MA	**$825.00**
8-Port	Slim	KV5108SA	**$1275.00**
12-Port	Full	KV5112FA	**$1825.00**
16-Port	Full	KV5116FA	**$2325.00**
For Sun Only			
2-Port	Mini	KV5202MA	**$795.00**
4-Port	Mini	KV5204MA	**$995.00**
8-Port	Slim	KV5208SA	**$1495.00**
12-Port	Full	KV5212FA	**$1995.00**
16-Port	Full	KV5216FA	**$2495.00**

Item	Chassis	Code	Price
ServSwitch Ultra Rackmount Kits			
19" Rack	Mini	RMK19M	**$35.00**
	Slim	RMK19S	**$35.00**
	Full	RMK19F	**$50.00**
23" Rack	Mini	RMK23M	**$40.00**
	Slim	RMK23S	**$40.00**
	Full	RMK23F	**$50.00**
24" Rack	Mini	RMK24M	**$40.00**
	Slim	RMK24S	**$40.00**
	Full	RMK24F	**$50.00**
ServSwitch Cables (For Multiplatform Applications: Connects Multisync Monitor, Sun Keyboard, and Sun Mouse)			
VGA/Sun Keyboard/Mouse			
5-ft.	(1.5-m)	EHN059-0005	**$47.95**
10-ft.	(3.0-m)	EHN059-0010	**$63.95**
20-ft.	(6.1-m)	EHN059-0020	**$95.95**
Coax VGA/Sun Keyboard/Mouse			
5-ft.	(1.5-m)	EHN220-0005	**$117.50**
10-ft.	(3.0-m)	EHN220-0010	**$140.00**
20-ft.	(6.1-m)	EHN220-0020	**$185.00**
50-ft.	(15.2-m)	EHN220-0050	**$320.00**
75-ft.	(22.9-m)	EHN220-0075	**$432.50**
100-ft.	(30.5-m)	EHN220-0100	**$545.00**
More ServSwitch Cables			**See page 284.**

remember to order cables

BLACK BOX® ServSwitch™ technology

FAXBACK INFO
Request Document Number: 18382
Call 412-746-5500
Anytime

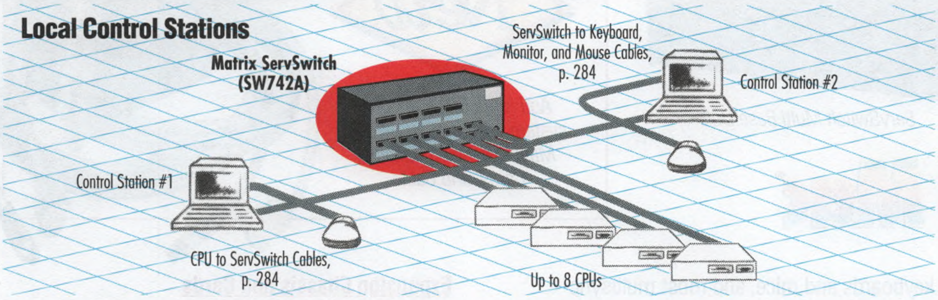
Matrix ServSwitch

Manage Your Servers from Two Workstations.

- **Use two workstations to control up to eight computers.**
- **Optional Matrix Expanders enable you to daisychain up to 128 CPUs.**
- **Switch via simple keyboard commands or convenient front-panel switches.**
- **Choose from 2 x 2, 2 x 4, 2 x 8 models.**

Designed for plug-and-play operation, the Matrix ServSwitch will help you organize your multiple-computer applications. You can use either of two keyboard/monitor/mouse stations to control up to eight computers.

BLACK BOX ServSwitch technology
BLACK BOX (412) 746-5500
Matrix ServSwitch


Local Control Stations
Matrix ServSwitch (SW742A)
ServSwitch to Keyboard, Monitor, and Mouse Cables, p. 284
Control Station #2
Control Station #1
CPU to ServSwitch Cables, p. 284
Up to 8 CPUs

remember to order cables

Cables for your Matrix ServSwitch, see p. 284.

FAXBACK INFORMATION
Request Document Number: 14278
Call 412-746-5500 Anytime

SPECIFICATIONS

Connectors — All models: (1) 5-pin DIN for power, (2) DB25F for keyboard/ monitor and mouse; (1) DB25F for each connected CPU

CE Approval — 230-VAC versions: SW740AE–SW742AE, SW745AE–SW748AE

Indicators — LEDs: (1) Power, (2) for each CPU selected

Power — 115 VAC, 60 Hz

Size — SW740A: 2.3"H x 8.8"W x 4.9"D (5.8 x 22.4 x 12.4 cm); SW741A–SW742A: 5.5"H x 13.5"W x 4.9"D (14 x 34.3 x 12.4 cm)

Weight — SW740A: 3 lb. (1.4 kg); SW741A–SW742A: 12 lb. (5.4 kg)

Item	Code	Price
Matrix ServSwitch		
2 x 2	SW740A	**$1190.00**
2 x 4	SW741A	**$1390.00**
2 x 8	SW742A	**$2590.00**
Matrix Expanders		
1 to 2	SW745A	**$595.00**
1 to 4	SW746A	**$695.00**
1 to 8	SW747A	**$1295.00**
1 to 16	SW748A	**$2095.00**

* * *

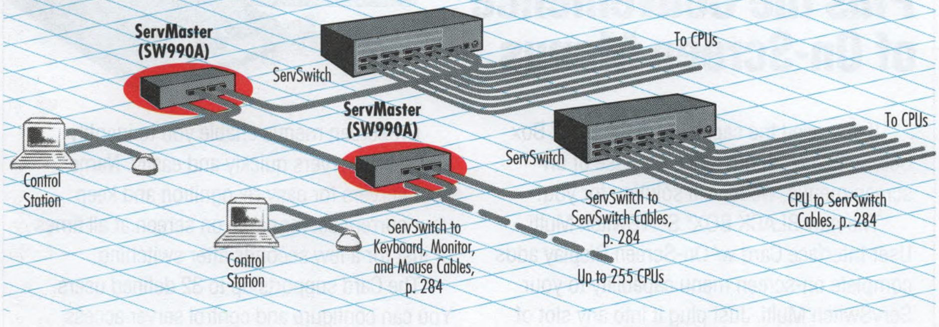
ServMaster
BLACK BOX (412) 746-5500
KEYBOARD / MONITOR / MOUSE
COMPUTER
ADDRESS
POWER STATUS SEND

ServMaster

Access to Hundreds of Connected CPUs from Any Workstation.

- **Take total control of up to 255 PCs (with up to 255 keyboards, monitors, and mice).**
- **Grant access to any station from any station.**
- **Excellent for classroom use.**
- **Send messages or take control of all connected PCs.**

NOTE: The ServMaster supports one CPU and one workstation per switch.


ServMaster (SW990A)
ServSwitch
To CPUs
ServMaster (SW990A)
To CPUs
ServSwitch
Control Station
ServSwitch to ServSwitch Cables, p. 284
CPU to ServSwitch Cables, p. 284
Control Station
ServSwitch to Keyboard, Monitor, and Mouse Cables, p. 284
Up to 255 CPUs

SPECIFICATIONS

CE Approval — 230-VAC version: SW990AE

Connectors — Bus: 13W3 female; CPU/Keyboard/Monitor/Mouse: DB25 female

Power — 115-VAC, 60-Hz adapter

Indicators — (3) LEDs: (1) Power, (1) Status, (1) Send

Size — 4.5"H x 13.5"W x 4.9"D (11.4 x 34.3 x 12.4 cm)

Weight — 12 lb. (5.4 kg)

Item	Code	Price
ServMaster	SW990A	**$695.00**
ServMaster Terminator	SW991	**$30.00**
ServMaster Bus Cable		
5-ft. (1.5-m)	EHN275-0005	**$92.50**
10-ft. (3.0-m)	EHN275-0010	**$105.00**
20-ft. (6.1-m)	EHN275-0020	**$130.00**
25-ft. (7.6-m)	EHN275-0025	**$142.50**
50-ft. (15.2-m)	EHN275-0050	**$205.00**
75-ft. (22.8-m)	EHN275-0075	**$267.50**
100-ft. (30.4-m)	EHN275-0100	**$330.00**

FAXBACK INFORMATION
Request Document Number: 14292
Call 412-746-5500 Anytime

remember to order cables

Cables for your ServMaster, **see p. 284.**

Control, Power, and, Versatility—

ServSwitch Multi • ServSwitch Multi Expansion Chassis and Cards

Multi-Platform
Supports PC, Sun, & Mac

BLACK BOX® (412) 746-5500
ServSwitch Multi
A
B
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ServSwitch Multi Base Unit

PC Sun® Mac®

BLACK BOX (412) 746-5500
ServSwitch Multi
New

Add more CPUs to your system with the ServSwitch Multi Expansion Chassis, Cards, and Cable.

- **Multiuser—any of up to four connected users can control any connected CPU.**
- **Multiplatform—mix and match PC, PS/2, Sun, and Mac CPUs.**
- **Use PS/2, Sun, or Mac keyboards and mice.**
- **Daisychain up to 3000 additional CPUs by adding Expansion Chassis and Cards.**

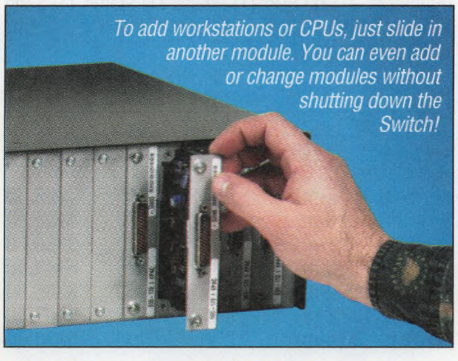
ServSwitch Multi Base Unit

We've combined the control of a matrix switch with the versatility of multiplatform support for our most powerful ServSwitch yet—the ServSwitch Multi.

The ServSwitch Multi is the ideal choice for your growing enterprise—start with one of our preconfigured models and add modules as your enterprise grows. The ServSwitch Multi Base Unit has 13 slots—up to four are for workstations. Use the rest for CPUs and an Expansion Card if necessary. When you outgrow your ServSwitch Multi Base Unit, just add an Expansion Chassis and Cards. Cables with audio enable you to add multimedia capabilities to your workstation.

Multiplatform

The ServSwitch Multi is compatible with PC, PS/2®, Sun®, and Macintosh® CPUs, most keyboards and mice, and most multisync monitors that support the resolution of the CPUs you're using.



To add workstations or CPUs, just slide in another module. You can even add or change modules without shutting down the Switch!

Multiple Users

ServSwitch Multi can accommodate up to four workstations. Each user can have access to any attached CPU—just by pushing a button. Of course, only one user at a time can access a CPU.

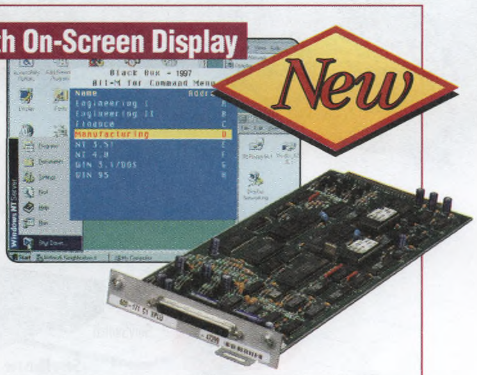
Modify on the Fly

ServSwitch Multi modules are hot-swappable—so you don't have to shut down your Switch or interrupt network performance to add or change modules.

Expansion Chassis and Cards

Ready to add more CPUs to your system? Just use the ServSwitch Multi Expansion Chassis. It has an additional 14 slots for connecting 13 additional CPUs. Insert an Expansion Receive Card into one of the slots on the ServSwitch Multi Base Unit and an Expansion Transmit Card into the Expansion Chassis, then connect the two cards with the 10-foot Expansion Cable. Still need more CPUs? Make the same connections from the Expansion Chassis to an additional Chassis. This way you can daisychain up to *3000* CPUs!

ServSwitch Multi User Interface Card with On-Screen Display



Now You Can Have All the Power and Control of the ServSwitch Multi *Plus* the Convenience of On-Screen Menus.

If you need the capability of the Black Box ServSwitch Multi but crave the ease of on-screen menus, we have a solution for you!

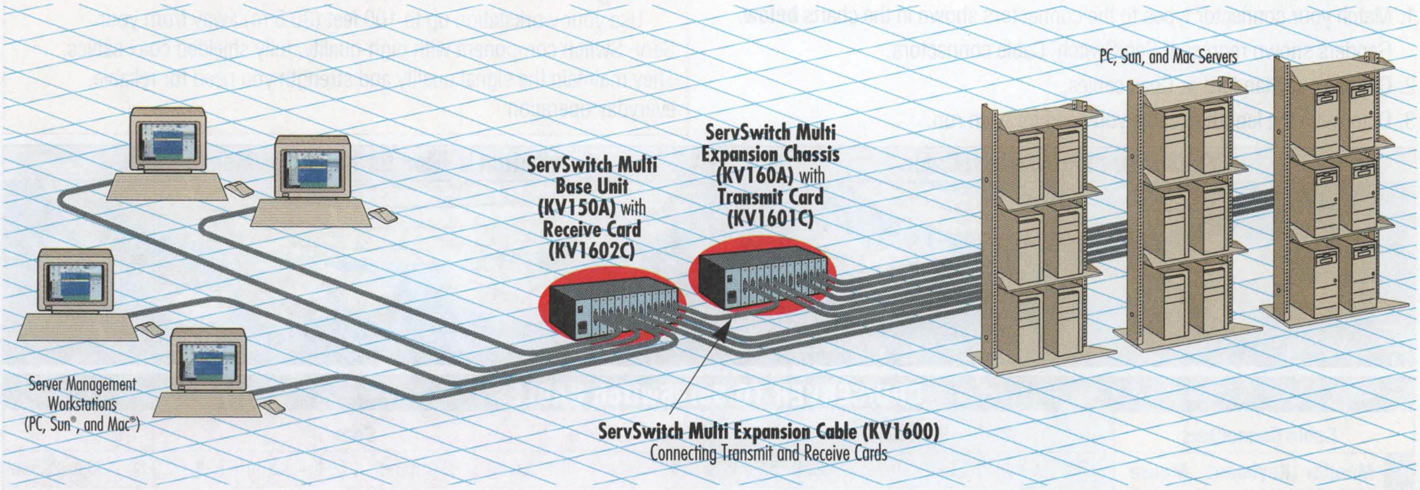
The new BLACK BOX® ServSwitch Multi User Interface Card w/ On-Screen Display adds complete on-screen menu capability to your ServSwitch Multi. Just plug it into any slot of your base unit and you're ready to go—no DIP switches or jumpers are needed to configure it.

On-screen menus enable you to identify and select servers quickly and easily. Name your servers for easy recognition and keep your current server name on screen at all times or just for a few seconds after switching.

The Card supports up to 32 defined users. You can configure and control server access for each user with the included security features.

Item	Code	Price
ServSwitch Multi User Interface Card with On-Screen Display	KV2550C	$600.00

Our Most Advanced ServSwitch!


PC, Sun, and Mac Servers
ServSwitch Multi Base Unit (KV150A) with Receive Card (KV1602C)
ServSwitch Multi Expansion Chassis (KV160A) with Transmit Card (KV1601C)
Server Management Workstations (PC, Sun®, and Mac®)
ServSwitch Multi Expansion Cable (KV1600)
Connecting Transmit and Receive Cards

ServSwitch Multi is the perfect solution for a large mixed-CPU computer room with multiple workstations. You can monitor and perform maintenance on the Servers without interfering with network performance.

SPECIFICATIONS

CPU Support — IBM® PC and compatibles, PS/2, Sun, Macintosh®; daisychainable to 3000 CPUs

Flow Control — Hardware: RS-232 at 9.6 Kbps; In-band: 115.2 Kbps

Mouse Support — Microsoft® Serial PS/2, Microsoft OEM-Style Serial, Logitech™ Mouseman/Trackman, IBM PS/2 Style, Kensington PS/2, Kensington ADB, Mouse Systems, Sun Microsystems® Laser, Apple® ADB and 100% compatibles

Video — Multisync video, maximum 1600 x 1280 at 60 Hz (155-MHz bandwidth)

CE Approval — All items listed are approved

Connectors — Base Unit: (2) 6-pin mini DIN female, (1) 4-pin mini DIN female, (1) 8-pin mini DIN female, (2) audio jacks (microphone and speaker), (2) DB9 male, (1) HD DB15 female;
Expansion Chassis: PS/2 Keyboard, PS/2 Mouse, Serial Mouse, Macintosh, Sun, VGA Video, Serial Port, Microphone, and Speakers;
Expansion Cards: KV1601C: (2) 26-pin male; KV1602C: (2) 26-pin female;
User Cables: All: (1) HD26;
PS/2: (1) HD DB15F, (2) 6-pin mini DIN F;
PC/AT: (1) HD DB15 F, (1) 5-pin DIN F, (1) DB9 M;
Macintosh: (1) DB15 F, (1) 4-pin mini DIN F;
Sun: (1) 13W3 F, (1) 8-pin mini DIN F;
Server Cables: All: (1) HD26;
PS/2: (1) HD DB15M, (2) 6-pin mini DIN M;
PC/AT: (1) HD DB15M, (1) 5-pin DIN M, (1) DB9F;
Macintosh: (1) DB15M, (1) 4-pin mini DIN M;
Sun: (1) 13W3 M, (1) 8-pin mini DIN M

Indicators — (12) LEDs

Power — 115–230 VAC, 50–60 Hz, autosensing

Size — Base Unit and Expansion Chassis: 5.5"H x 17.1"W x 13.6"D (14 x 43.4 x 34.5 cm)

Weight — Base Unit and Expansion Chassis: 18.5 lb. (8.4 kg); Modules: 0.6 lb. (0.3 kg)

BLACK BOX® ServSwitch™ technology

FAXBACK INFORMATION
Request Document Number: 17855
Call 412-746-5500 Anytime

Item	Code	Price
Start with the ServSwitch Multi Base Unit (includes support for one workstation).		
Base Unit	KV150A	**$995.00**
For each additional workstation (up to three), add a User Interface Card.		
Universal User Interface Card	KV2500C	**$400.00**
User Interface Card with On-Screen Display	KV2550C	**$600.00**
Select an appropriate User Cable (see chart below) for each User Interface Card.		
For each attached CPU, add an Autosensing CPU Interface Card:		
Autosensing CPU Interface Card	KV2000C	**$295.00**
Select an appropriate Server Cable (see chart below) for each CPU Interface Card.		
To add more CPUs, add an Expansion Chassis.		
Expansion Chassis	KV160A	**$695.00**
Attach the Expansion Chassis to the Base Unit.		
Expansion Transmit Card	KV1601C	**$250.00**
Expansion Receive Card	KV1602C	**$250.00**
Expansion Cable 10'	KV1600	**$49.00**

See page 23 for our new Expansion Cards that use versatile Category 5 cable for distances up to 250 feet.

remember to order cables

User Cables	1' Standard		1' with Audio		10' with Audio	
PS/2®	KV2500	**$56.95**	KV2510	**$66.95**	KV2540	**$121.95**
PC/AT®	KV2600	**$56.95**	KV2610	**$66.95**	KV2640	**$121.95**
Mac®	KV2700	**$56.95**	KV2710	**$66.95**	KV2740	**$121.95**
Sun®	KV2800	**$56.95**	KV2810	**$66.95**	KV2840	**$121.95**

Server Cables	8' Standard		8' with Audio		20' with Audio		30' with Audio	
PS/2	KV2020	**$86.95**	KV2040	**$96.95**	KV2060-R2	**$135.00**	KV2080-R2	**$165.00**
PC/AT	KV2120	**$86.95**	KV2140	**$96.95**	KV2060-R2	**$135.00**	KV2080-R2	**$165.00**
Mac	KV2220	**$86.95**	KV2240	**$96.95**	KV2260	**$136.95**	KV2280	**$167.95**
Sun	KV2320	**$86.95**	KV2340	**$96.95**	KV2360	**$136.95**	KV2380	**$167.95**

All the Cables You Need for ServSwitch Connections.

Cables for ServSwitch, ServManager, Matrix ServSwitch, and ServMaster

Find the cable you need in three easy steps:

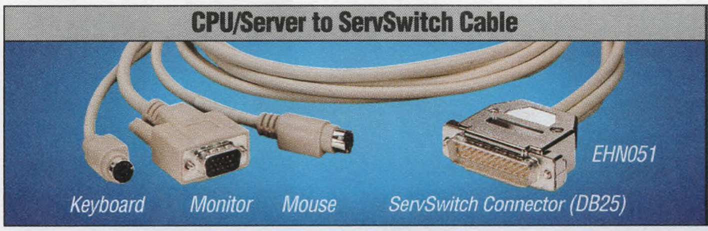
1. Match your connector types to the connectors shown in the charts **below**. Genders shown represent ServSwitch™ Cable connectors.
2. Choose our Standard or Coax cables.
3. Determine the length of cable you need for each run.

Black Box Explains...

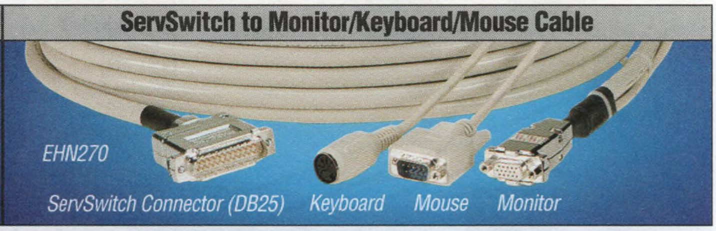
Using Coax Cables for ServSwitches.

Use your workstation up to 100 feet (30.5 m) away from your Serv- Switch component with high-quality, fully shielded coax cables. They maintain the signal quality and strength you need for reliable, everyday operation.

CPU/Server to ServSwitch Cable



ServSwitch to Monitor/Keyboard/Mouse Cable



CPU/SERVER TO ServSwitch CABLES

	Cable Connectors			Standard			Coax					
	Monitor	Keyboard	Mouse	5-ft. (1.5-m)	10-ft. (3.0-m)	20-ft. (6.1-m)	5-ft. (1.5-m)	10-ft. (3.0-m)	20-ft. (6.1-m)	50-ft. (15.2-m)	75-ft. (22.9-m)	100-ft. (30.5-m)
PC	DB15-HD	5-Pin DIN	DB9	EHN048-0005 **$47.95**	EHN048-0010 **$63.95**	EHN048-0020 **$95.95**	EHN271-0005 **$117.50**	EHN271-0010 **$140.00**	EHN271-0020 **$185.00**	EHN271-0050 **$320.00**	EHN271-0075 **$432.50**	EHN271-0100 **$545.00**
	DB15-HD	6-Pin Mini DIN	6-Pin Mini DIN	EHN051-0005 **$47.95**	EHN051-0010 **$63.95**	EHN051-0020 **$95.95**	EHN272-0005 **$117.50**	EHN272-0010 **$140.00**	EHN272-0020 **$185.00**	EHN272-0050 **$320.00**	EHN272-0075 **$432.50**	EHN272-0100 **$545.00**
	DB9	5-Pin DIN	DB9	EHN049-0005 **$47.95**	EHN049-0010 **$63.95**	EHN049-0020 **$95.95**						
Sun	13W3	8-Pin Mini DIN		Only Coax is recommended for Sun.			EHN205-0005 **$105.00**	EHN205-0010 **$122.50**	EHN205-0020 **$157.50**			
Mac	DB15	4-Pin Mini DIN		EHN215-0005 **$47.95**	EHN215-0010 **$63.95**	EHN215-0020 **$95.95**						

ServSwitch TO MONITOR/KEYBOARD/MOUSE CABLES

	Cable Connectors			Standard				Coax					
	Monitor	Keyboard	Mouse	1-ft. (0.3-m)	5-ft. (1.5-m)	10-ft. (3.0-m)	20-ft. (6.1-m)	5-ft. (1.5-m)	10-ft. (3.0-m)	20-ft. (6.1-m)	50-ft. (15.2-m)	75-ft. (22.9-m)	100-ft. (30.5-m)
PC	DB15-HD	5-Pin DIN	DB9	EHN052-0001 **$31.95**	EHN052-0005 **$47.95**	EHN052-0010 **$63.95**	EHN052-0020 **$95.95**	EHN270-0005 **$117.50**	EHN270-0010 **$140.00**	EHN270-0020 **$185.00**	EHN270-0050 **$320.00**	EHN270-0075 **$432.50**	EHN270-0100 **$545.00**
	DB15-HD	6-Pin Mini DIN	6-Pin Mini DIN	EHN054-0001 **$31.95**	EHN054-0005 **$47.95**	EHN054-0010 **$63.95**	EHN054-0020 **$95.95**	EHN273-0005 **$117.50**	EHN273-0010 **$140.00**	EHN273-0020 **$185.00**	EHN273-0050 **$320.00**	EHN273-0075 **$432.50**	EHN273-0100 **$545.00**
	DB9	5-Pin DIN	DB9	EHN053-0001 **$31.95**	EHN053-0005 **$47-95**	EHN053-0010 **$63.95**	EHN053-0020 **$95.95**						
Sun	13W3	8-Pin Mini DIN		Only Coax is recommended for Sun.				1-ft. (0.3-m) EHN200-0001 **$91.00**					
Mac	DB15	4-Pin Mini DIN		EHN210-0001 **$31.95**	EHN210-0005 **$47.95**	EHN210-0010 **$63.95**	EHN210-0020 **$95.95**						

White connectors are male; black connectors are female.
All ServSwitch connections are DB25.

Mac and Sun cables are specially designed for ServSwitch Technology Switches.
Call Tech Support for cables for other Mac® and Sun® switches.

ServSwitch TO SERVSWITCH CABLES

Connecting more ServSwitch components to the ones you already have? Here are the cables you need.

	Cable Connectors	Standard	Coax					
		1-ft. (0.3-m)	5-ft. (1.5-m)	10-ft. (3-m)	25-ft. (7.6-m)	50-ft. (15.2-m)	75-ft. (22.9-m)	100-ft. (30.5-m)
PC	DB25	EHN055-0001 **$15.00**	EHN274-0005 **$92.50**	EHN274-0010 **$105.00**	EHN274-0025 **$142.50**	EHN274-0050 **$205.00**	EHN274-0075 **$267.50**	EHN274-0100 **$330.00**
Sun	13W3		EHN275-0005 **$92.50**	EHN275-0010 **$105.00**	EHN275-0025 **$142.50**	EHN275-0050 **$205.00**	EHN275-0075 **$267.50**	EHN275-0100 **$330.00**

In This Section...
◁ Manual
◁ Ganged

Cables for the ServSwitch Multi and ServSelect

These are the same cables as in the ServSwitch Multi Interface Kits on **pp. 282–283**. If you change equipment from a PS/2 to a PC AT, for example, you don't need to buy a new Kit. Use the same module and just order a new cable.

Find the cable you need in three easy steps:

1. Match your connector types to the connectors shown in the charts **below**. Genders shown represent ServSwitch Cable connectors.
2. Choose our Standard or With Audio cables.
3. Determine the length of cable you need for each run.

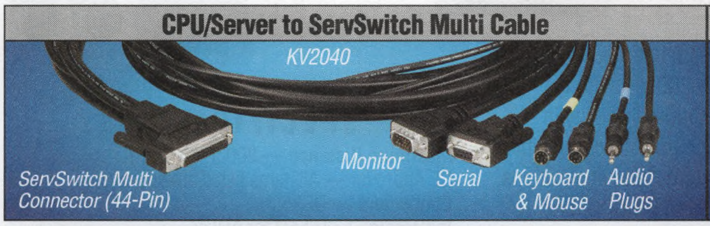
PLUS! ServSeries Racks, **see p. 164.**

Black Box Explains...

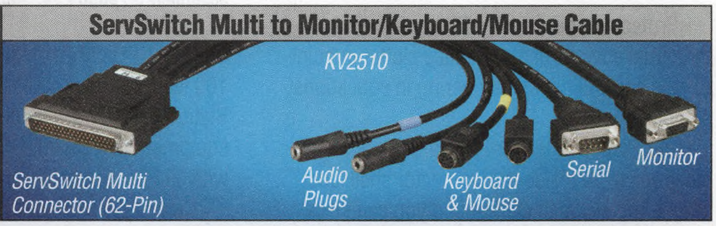
Adding Audio to Your ServSwitch Multi.

Get more out of your ServSwitch Multi with audio. Add a set of speakers and a microphone to each CPU. For only slightly more than Standard Cables, Audio Cables turn the ServSwitch Multi into the ideal system for education, training, retail, medical, and office environments. Even if you don't have audio equipment now, plan ahead. When you're ready to add audio equipment, all you'll have to do is plug it in.

CPU/Server to ServSwitch Multi Cable



ServSwitch Multi to Monitor/Keyboard/Mouse Cable



CPU/SERVER TO ServSwitch MULTI CABLES

	Cable Connectors				Standard	Audio Connectors		With Audio		
	ServSwitch	**Monitor**	**Keyboard**	**Mouse**	8-ft. (2.4-m)	**Audio**	**Serial**	8-ft. (2.4-m)	20-ft. (6.1-m)	30-ft. (9.0-m)
PC	44-Pin	DB15-HD	6-Pin Mini DIN	6-Pin Mini DIN	KV2020 **$86.95**	Male Audio (2)	DB9	KV2040 **$96.95**	KV2060 **$136.95**	KV2080 **$167.95**
	44-Pin	DB15-HD	5-Pin DIN	DB9	KV2120 **$86.95**	Male Audio (2)	DB9	KV2140 **$96.95**	KV2160 **$136.95**	KV2180 **$167.95**
Sun	44-Pin	13W3	8-Pin Mini DIN		KV2320 **$86.95**	Male Audio (2)	DB9	KV2340 **$96.95**	KV2360 **$136.95**	KV2380 **$167.95**
Mac	44-Pin	DB15	4-Pin Mini DIN		KV2220 **$86.95**	Male Audio (2)	DB9	KV2240 **$96.95**	KV2260 **$136.95**	KV2280 **$167.95**

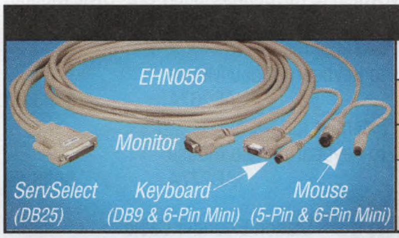
ServSwitch MULTI TO MONITOR/KEYBOARD/MOUSE CABLES

	Cable Connectors				Standard	Audio Connectors		With Audio	
	ServSwitch	**Monitor**	**Keyboard**	**Mouse**	1-ft. (0.3-m)	**Audio**	**Serial**	1-ft. (0.3-m)	10-ft. (3.0-m)
PC	62-Pin	DB15-HD	6-Pin Mini DIN	6-Pin Mini DIN	KV2500 **$56.95**	Female Audio (2)	DB9	KV2510 **$66.95**	KV2540 **$121.95**
	62-Pin	DB15-HD	5-Pin DIN	DB9	KV2600 **$56.95**	Female Audio (2)	DB9	KV2610 **$66.95**	KV2640 **$121.95**
Sun	62-Pin	DB15-HD	8-Pin Mini DIN		KV2800 **$56.95**	Female Audio (2)	DB9	KV2810 **$66.95**	KV2840 **$121.95**
Mac	62-Pin	DB15-HD	4-Pin Mini DIN	DB9	KV2700 **$56.95**	Female Audio (2)	DB9	KV2710 **$66.95**	KV2740 **$121.95**

White connectors are male; black connectors are female.

Call Tech Support for cables for other Mac® and Sun® switches.

SERVSELECT CABLES



Need to add more computers to your ServSelect? Here are the cables you need.

Cable Connectors						Standard			
ServSelect	**Monitor**	**Keyboard**		**Mouse**		6-ft. (1.8-m)	8-ft. (2.4-m)	15-ft. (4.5-m)	30-ft. (9.0-m)
DB25	DB15-HD	DB9	6-Pin Mini DIN	5-Pin DIN	6-Pin Mini DIN	EHN056-0006 **$45.95**	EHN056-0008 **$62.95**	EHN056-0015 **$87.00**	EHN056-0030 **$133.00**

ServSwitch TO MULTISYNC MONITOR AND Sun KEYBOARD/MOUSE (MULTIPLATFORM APPLICATIONS)

New

Cable Connectors		Standard			Coax					
		5-ft. (1.5-m)	10-ft. (3.0-m)	20-ft. (6.1-m)	5-ft. (1.5-m)	10-ft. (3-m)	20-ft. (6.1-m)	50-ft. (15.2-m)	75-ft. (22.9-m)	100-ft. (30.5-m)
DB15-HD	8-Pin Mini DIN	EHN059-0005 **$47.95**	EHN059-0010 **$63.95**	EHN059-0020 **$95.95**	EHN220-0005 **$117.50**	EHN220-0010 **$140.00**	EHN220-0020 **$185.00**	EHN220-0050 **$320.00**	EHN220-0075 **$432.50**	EHN220-0100 **$545.00**

Station Extender

Place Your Keyboard, Monitor, and Mouse out of Harm's Way.

- **Move your PC keyboard, monitor, and mouse up to 200 feet away from your CPU.**
- **Totally transparent to your applications.**
- **Easy to install.**

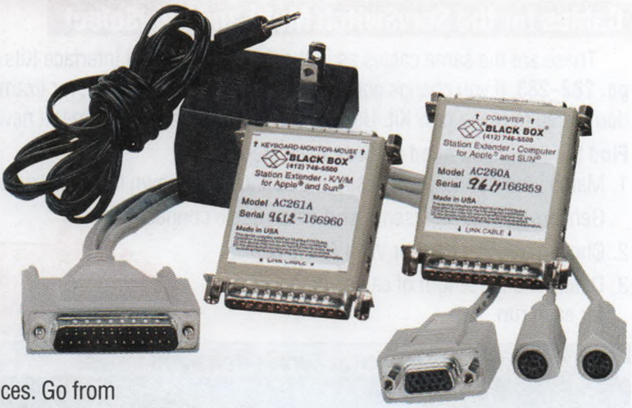
Protect your expensive PC equipment in industrial environments. Reduce clutter in point-of-sale sites. Eliminate tampering in educational settings.

Our Station Extender is ultra-compact—all electronics are inside the connector shell. Just plug in the included cables, and you can place your monitor, keyboard, and mouse up to 200 feet (76.2 m) away from your CPU. Then select the Station Extender Cable you need.

The Station Extender for PC works with our ServSwitch (**page 277**), so you can control multiple CPUs from greater distances. Go from 100 feet over coax cable to 200 feet with the Station Extenders. You get more flexibility in equipment placement. Of course, it's compatible with all PCs, operating systems, and applications.

Connect devices directly to the CPU, or through our ServSwitch.

Use the **Station Extender for Mac or for Sun** as a simple and inexpensive video extender. Move your Keyboard/Video/Mouse up to 200 feet away from your CPU.


KEYBOARD-MONITOR-MOUSE
BLACK BOX
(412) 746-5500
Station Extender - K/V/M
for Apple® and Sun®
Model AC261A
Serial 9612-166960
Made in USA
LINK CABLE
COMPUTER
BLACK BOX
(412) 746-5500
Station Extender - Computer
for Apple® and SUN®
Model AC260A
Serial 9611166859
Made in USA
LINK CABLE

*Top: Station Extenders; Bottom: CPU/Server to ServSwitch Cable and monitor, keyboard, and mouse to ServSwitch Cable. Cables are sold separately on **page 284**.*

Keep Your CPU Safe and Sound.

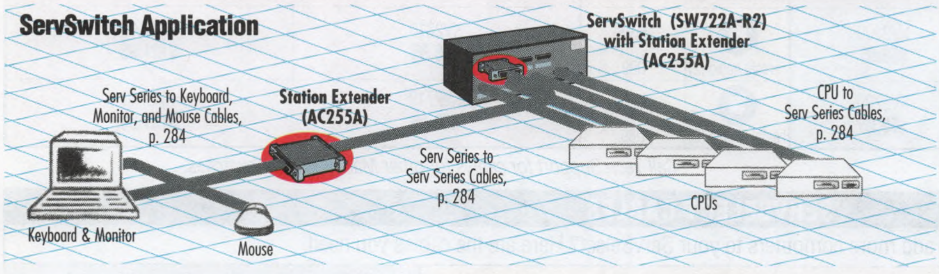
A Station Extender enables you to move a single PC, Mac® or Sun® CPU away from its workstation. This means you can keep your CPU locked away, safe from knocks, spills, vibration—even theft.

What's in the CPU-to-Keyboard/Video/Mouse Kits:

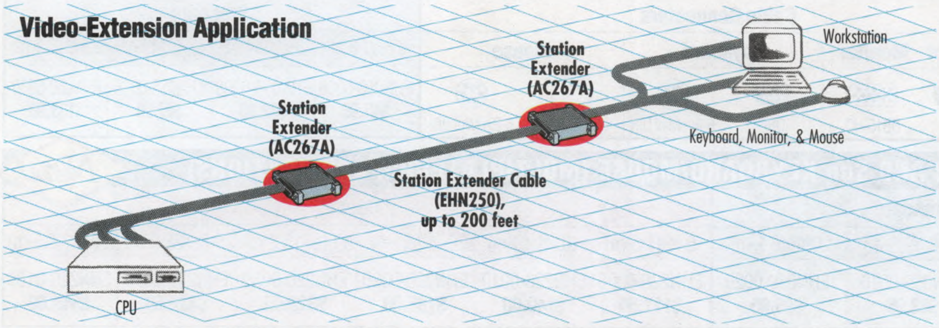
- (2) Station Extenders
- Keyboard/Video/ Mouse-to-Station-Extender Cable
- CPU-to-Station-Extender Cable
- Power Supply

Remember to order Station Extender Cable.

ServSwitch Application


ServSwitch (SW722A-R2) with Station Extender (AC255A)
Serv Series to Keyboard, Monitor, and Mouse Cables, p. 284
Station Extender (AC255A)
CPU to Serv Series Cables, p. 284
Serv Series to Serv Series Cables, p. 284
Keyboard & Monitor
Mouse
CPUs

Video-Extension Application


Workstation
Station Extender (AC267A)
Station Extender (AC267A)
Keyboard, Monitor, & Mouse
Station Extender Cable (EHN250), up to 200 feet
CPU

SPECIFICATIONS

Maximum Distance — 200 ft. (76.2 m)
CE Approval — All items listed are approved
Connectors — DB25M
Indicators — (1) LED for power
Power — From power supply or interface
Size — 0.6"H x 2.1"W x 2.5"D (1.5 x 5.3 x 6.4 cm)
Weight — 0.1 lb. (< 0.1 kg)

PC Sun Mac®

FAXBACK INFORMATION
Station Extenders for PCs: 14302,
Station Extenders for Mac & Sun: 17288,
Call 412-746-5500 Anytime

Item	Code	Price
Station Extender for PC		
CPU to Keyboard/Video/Serial Mouse	AC253A	**$465.00**
CPU to ServSwitch/Serial Mouse	AC254A	**$435.00**
ServSwitch to Keyboard/Video/Serial Mouse	AC255A	**$425.00**
ServSwitch to ServSwitch	AC256A	**$395.00**
CPU to Keyboard/Video/PS/2 Style Mouse	AC257A	**$465.00**
CPU to ServSwitch/PS/2 Style Mouse	AC258A	**$435.00**
ServSwitch to Keyboard/Video/PS/2® Style Mouse	AC259A	**$425.00**
Station Extender for Mac		
CPU to Keyboard/Video/Mouse	AC267A	**$495.00**
Station Extender for Sun		
CPU to Keyboard/Video/Mouse	AC277A	**$495.00**
remember to order cables Station Extender Cable		
50-ft. (15.2-m)	EHN250-0050	**$205.00**
100-ft. (30.4-m)	EHN250-0100	**$330.00**
150-ft. (45.7-m)	EHN250-0150	**$455.00**
200-ft. (60.9-m)	EHN250-0200	**$580.00**

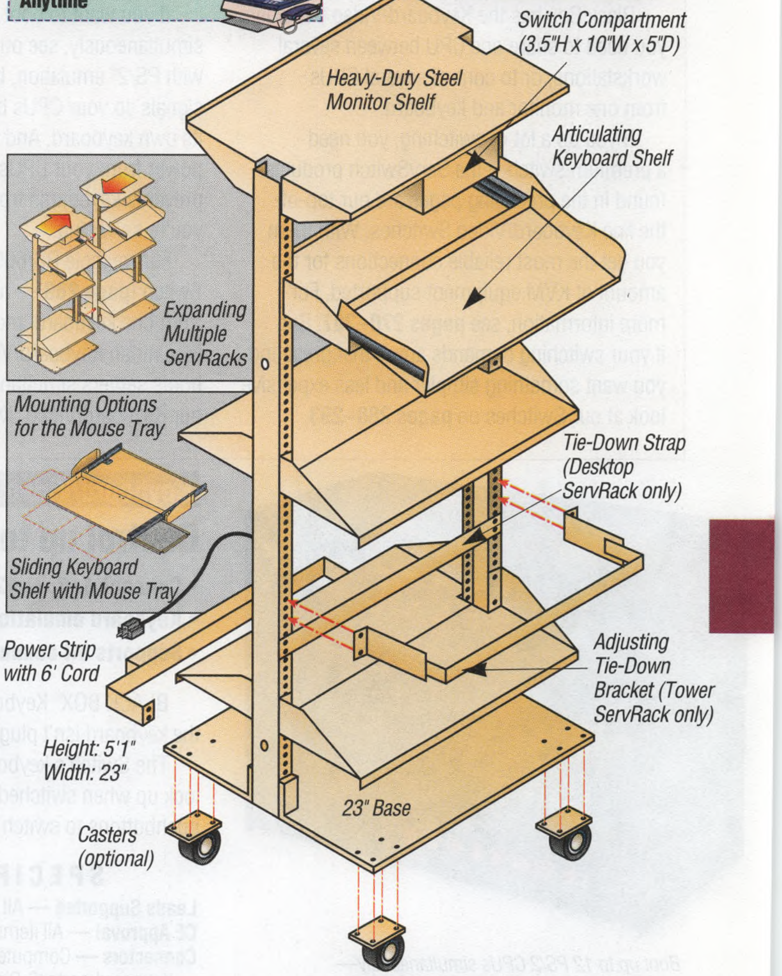
ServRacks

Don't Stack 'em—Rack 'em!

FAXBACK INFO
Request Document Number: 15561
Call 412-746-5500
Anytime

EXCLUSIVE

- Organizes your desktop or tower servers.
- Choose from two easy-sliding keyboard shelves—either a sliding shelf with mouse tray or an articulating shelf for easy viewing.
- Six-outlet power strip with surge protection can be mounted anywhere on your rack.
- Heavy-duty monitor shelf holds 75 pounds.
- Sturdy steel CPU shelves are adjustable and double-sided. They hold up to 100 pounds each.
- All assembly hardware is included and packed flat for easy shipping. All you need is a Phillips screwdriver and a ¾" socket or wrench.


Switch Compartment (3.5"H x 10"W x 5"D)
Heavy-Duty Steel Monitor Shelf
Articulating Keyboard Shelf
Expanding Multiple ServRacks
Mounting Options for the Mouse Tray
Sliding Keyboard Shelf with Mouse Tray
Tie-Down Strap (Desktop ServRack only)
Power Strip with 6' Cord
Adjusting Tie-Down Bracket (Tower ServRack only)
Height: 5'1"
Width: 23"
23" Base
Casters (optional)

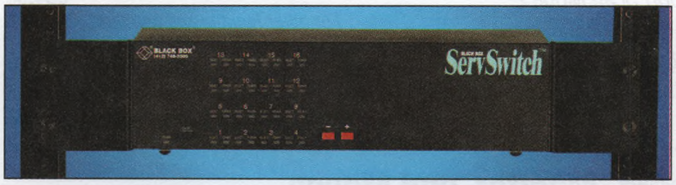
Item	**Code**	**Price**
Desktop ServRack		
with Sliding Keyboard Shelf and Mouse Tray		
Beige	RM360A	**$1095.00**
Black	RM361A	**$1095.00**
with Articulating Keyboard Shelf		
Beige	RM362A	**$1095.00**
Black	RM363A	**$1095.00**
Tower ServRack		
with Sliding Keyboard Shelf and Mouse Tray		
Beige	RM364A	**$1095.00**
Black	RM365A	**$1095.00**
with Articulating Keyboard Shelf		
Beige	RM366A	**$1095.00**
Black	RM367A	**$1095.00**
Optional Casters (4)	RM369	**$95.00**

Need a specific color? Just give us a call!

ServSwitch Rackmount Kits

New

- Install ServSwitches with a mini, standard, or full chassis in any standard rack.


BLACK BOX
ServSwitch

Item		**Code**	**Price**
ServSwitch Rackmount Kits			
19" Rack	Mini	RMK19M	**$35.00**
	Slim	RMK19S	**$35.00**
	Full	RMK19F	**$50.00**
23" Rack	Mini	RMK23M	**$40.00**
	Slim	RMK23S	**$40.00**
	Full	RMK23F	**$50.00**
24" Rack	Mini	RMK24M	**$40.00**
	Slim	RMK24S	**$40.00**
	Full	RMK24F	**$50.00**

ServSwitch Overlay Option Board

New

- Add on-screen menus to your ServSwitch. See **page 275** for details on on-screen menus.
- Works with the classic ServSwitch for PC (SW723A-R3–SW725A-R3, KV3104FA, KV3108SA), Slim and Full-sized chassis only. See **page 277**.

Item	**Code**	**Price**
ServSwitch Overlay Option Board	SW720C-R3	**$300.00**

Black Box Explains...

Types of KVM Switches.

Black Box has the Keyboard/Video Switches you need to share one CPU between several workstations, or to control several CPUs from one monitor and keyboard.

If you do a lot of switching, you need a premium switch—the ServSwitch products found in the preceding pages are our top-of-the line Keyboard/Video Switches. With them you get the most reliable connections for the amount of KVM equipment supported. For more information, see **pages 270–287**. But, if your switching demands aren't that great and you want something simpler and less expensive, look at our Switches on **pages 288–293**.

If you want to boot all your attached CPUs simultaneously, see our Keyboard/Video Switches with PS/2® emulation, **below**. They send keyboard signals so your CPUs boot up as though each had its own keyboard. And the Switches won't take power from your CPUs' keyboard ports. This prevents keyboards from locking up when you're switching.

For multiple RS/6000 servers, try the KVMS Switch (**page 289**)—run up to six servers from one keyboard, monitor, and mouse! Our Macintosh Keyboard/Video Switch (**page 290**) boots servers simultaneously, too. And with our Keyboard/Video Switch for Macintosh (**page 290**), you can control up to 12 Mac® CPUs from one keyboard and monitor.

Share a keyboard, monitor, and mouse with two or four CPUs with the BLACK BOX® KVM Switch (**below, pages 290–291**). It's available in configurations for IBM® PC, Macintosh®, and Sun® Workstation®.

On **pages 292–293**, you'll find our workhorse, long-life manual keyboard/video switches. They're perfect for basic switching applications—for classrooms, training sessions, anywhere you need to share images or maintain control from one location. Best of all, they're guaranteed for life.

MADE IN U.S.A.
BLACK BOX
KEYBOARD/VIDEO SWITCH
C
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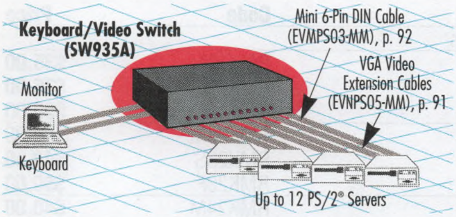
Boot up to 12 PS/2 CPUs simultaneously—without a keyboard or operator intervention.


Keyboard/Video Switch (SW935A)
Mini 6-Pin DIN Cable (EVMPS03-MM), p. 92
VGA Video Extension Cables (EVNPS05-MM), p. 91
Monitor
Keyboard
Up to 12 PS/2® Servers

Keyboard/Video Switches (with Emulation for PS/2)

Control up to 12 PS/2 CPUs from One Keyboard and Monitor.

- **Connect 4, 8, or 12 PS/2 type 286, 386, and 486 CPUs to one keyboard and monitor.**
- **Keyboard emulation provides automatic, simultaneous booting.**
- **Supports all common video standards: monochrome, Hercules® monochrome, CGA, EGA, or VGA.**

BLACK BOX® Keyboard/Video Switches for PS/2 send keyboard booting signals to the CPU even when the keyboard isn't plugged in—so all connected CPUs boot simultaneously without operator intervention.

The Switch's keyboard circuit doesn't take power from the CPUs' keyboard ports so the ports won't lock up when switched. Use the front-panel pushbuttons to switch between your PS/2 CPUs.

SPECIFICATIONS

Leads Supported — All pins
CE Approval — All items listed are approved
Connectors — Computer port: DB15HD female; Keyboard ports: 6-Pin Mini-DIN female
Power — None required
Size — 3.5"H x 10.5"W x 5"D (8.9 x 26.7 x 12.7 cm)
Weight — 7 lb. (3.2 kg)

NOTE: These Switches support Scan Mode 2. If your application has both PC and PS/2 CPUs, or you require other types of PS/2 scan-mode emulation, see the ServSwitch on page 277.

Item	Connectors	Code	Price
Keyboard/Video Switches (with Emulation for PS/2)			
4 to 1	(5) DB15HD (5) 6-Pin Mini DIN Female	SW936A	**$750.00**
8 to 1	(9) DB15HD (9) 6-Pin Mini DIN Female	SW934A	**$1250.00**
12 to 1	(13) DB15HD (13) 6-Pin Mini DIN Female	SW935A	**$1450.00**

remember to order cables

VGA Video Extension Cable, 10-ft. (3.0-m), Male/Male
EVNPS05-0010-MM **$34.95**

For other lengths and genders, see p. 91.

Mini 6-Pin DIN Cable, 10-ft. (3.0-m) Male/Male
EVMPS03-0010-MM **$25.95**

For other lengths and genders, see p. 92.

◆ ◆ ◆

KVM Switch

Share 2 or 4 PC CPUs with One Keyboard, Monitor, and Mouse.

- **Choose 2- or 4-Port models.**
- **Get automatic boot-up.**

Control 2 or 4 PC computers from a single keyboard, monitor, and mouse with the BLACK BOX® KVM Switch. And you don't have to worry about lock-ups or rebooting. The Switch reboots CPUs automatically.

BLACK BOX
(412) 746-5500
KVM Switch
POWER
1
2
3
4

SPECIFICATIONS

CE Approval — All items listed are approved
Connectors — DB25 female: (1) for monitor/keyboard/mouse, (1) for each port to CPUs
Power — None required
Size — 2.3"H x 8.8"W x 4.9"D (5.7 x 22.4 x 12.5 cm)
Weight — 3 lb. (1.4 kg)

FAXBACK INFORMATION
Request Document Number: 13349
Call 412-746-5500 Anytime

Item		Code	Price
KVM Switch	2-Port	SW730A	**$395.00**
	4-Port	SW731A	**$495.00**

remember to order cables

	Code	1-ft. (0.3-m)	5-ft. (1.5-m)	10-ft. (3.0-m)	20-ft. (6.0-m)
Cables from CPU to KVM Switch					
Mouse CPU Cable VGA/AT/Serial	EHN048		**$47.95**	**$63.95**	**$95.95**
EGA/AT/Serial	EHN049		**$47.95**	**$63.95**	**$95.95**
Cables from KVM Switch to Keyboard					
Mouse Unit Cable VGA/AT/Serial	EHN052	**$31.95**			
EGA/AT/Serial	EHN053	**$31.95**			

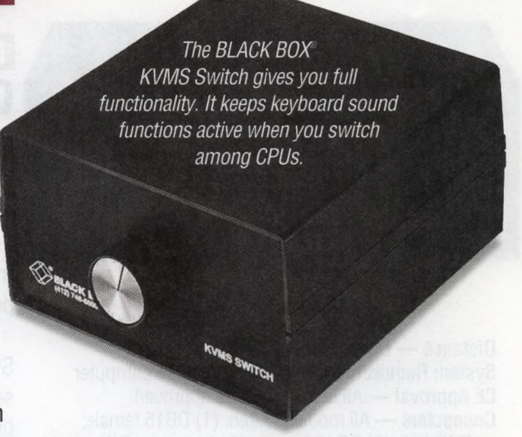
KVMS Switch

Run Multiple RS/6000 Servers from Just One Keyboard, Monitor, and Mouse—and Save!

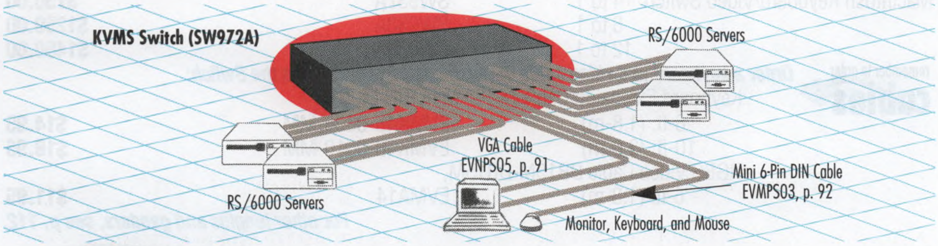
- **One monitor, keyboard, and mouse can control up to six RS/6000 servers.**
- **Keyboard sound functions stay active when you switch among CPUs.**
- **Rackmountable versions are available.**

Instead of paying for multiple keyboards, monitors, and mice, use the BLACK BOX® KVMS Switch and share a single set.

This manual Switch is easy to use. Boot all RS/6000 servers individually through the Switch and then just turn the knob on the front of the Switch to select the CPU you want. When you switch between CPUs, your keyboard and monitor don't freeze—so you won't have to reboot again and again.



The BLACK BOX® KVMS Switch gives you full functionality. It keeps keyboard sound functions active when you switch among CPUs.


KVMS Switch (SW972A)
RS/6000 Servers
VGA Cable
EVNPS05, p. 91
Mini 6-Pin DIN Cable
EVMPS03, p. 92
RS/6000 Servers
Monitor, Keyboard, and Mouse

SPECIFICATIONS

Controls — (1) Rotary switch for selecting processor

Leads Supported — High-density 15-pin: 1–8, 10–14 (Pin 9 is keyed);
Mini DIN, 6-pin (2 each): all six (6) leads supported

Connectors — Mouse and keyboard: Mini 6-pin DIN, female;
Monitor: DB15S high-density, female

Power — None required

Size — SW970A–SW971A: 3.8"H x 6"W x 6.3"D (8.9 x 15.3 x 16 cm);
SW972A–SW974A: 3.5"H x 17"W x 5.9"D (8.9 x 43.2 x 15 cm);
Rackmount Models: 3.5"H x 19"W x 5.9"D (8.9 x 48.3 x 15 cm)

Weight — 1.3 lb. (0.6 kg)

Item	Code	Price
KVMS Switch		
Desktop		
2 to 1	SW970A	**$275.00**
3 to 1	SW971A	**$350.00**
4 to 1	SW972A	**$405.00**
5 to 1	SW973A	**$475.00**
6 to 1	SW974A	**$525.00**
Rackmount		
2 to 1	SR970A	**$300.00**
3 to 1	SR971A	**$375.00**
4 to 1	SR972A	**$405.00**
5 to 1	SR973A	**$475.00**
6 to 1	SR974A	**$525.00**

remember to order cables

VGA Video Extension Cable, 10-ft. (3.0-m), Male/Male
EVNPS05-0010-MM **$34.95**
For other lengths and genders, see p. 91.

Mini 6-Pin DIN Cable, 10-ft. (3.0-m) Male/Male
EVMPS03-0010-MM **$25.95**
For other lengths and genders, see p. 92.

◆ ◆ ◆

Keyboard/Video Switches EGA/CGA (for PC, AT, XT)

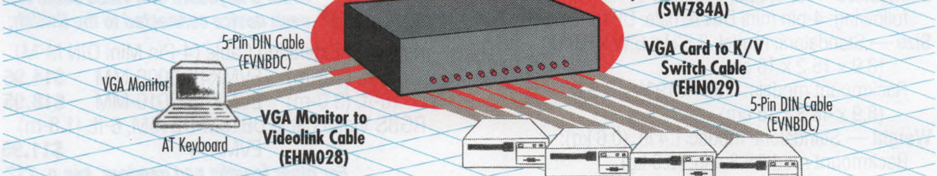
Just Push a Button and Switch among 12 PC, AT, or XT CPUs.

BLACK BOX
KEYBOARD/VIDEO SWITCH
1 2 3 4 5 6 7 8 9 10 11 12
12 11 10 9 8 7 6 5 4 3 2 1 C
MADE IN U.S.A.

- **Connect 4, 8, or 12 PC, AT®, or XT™ CPUs through one keyboard and one monitor.**
- **The Switches support all common video standards: monochrome, Hercules monochrome, CGA, EGA, and VGA.**
- **Nonpowered—so you can put them where you want them.**

Here's an easy way to access multiple LAN servers from a single keyboard and monitor. Just push one of the front-panel buttons to choose any one of 4, 8, or 12 CPUs. Boot each CPU individually.

These Switches are ideal for use in classrooms, training areas, process control and testing laboratories. For VGA support, order the EHM028 and EHM029 cables listed **at right**.


Keyboard/Video Switch
(SW784A)
5-Pin DIN Cable
(EVNBDC)
VGA Monitor
VGA Card to K/V
Switch Cable
(EHN029)
5-Pin DIN Cable
(EVNBDC)
AT Keyboard
VGA Monitor to
Videolink Cable
(EHM028)

SPECIFICATIONS

CE Approval — All items listed are approved

Connectors — Computer video ports: DB9 male;
Monitor port: DB9 female;
Keyboard ports: 5-pin DIN jack

Power — None required

Size — 3.5"H x 10.5"W x 5"D (8.9 x 26.7 x 12.7 cm)

Weight — 7 lb. (3.2 kg)

Item		Code	Price
Keyboard/Video Switches EGA/CGA (for PC, AT, XT)			
4 to 1	(4) DB9 Male (1) DB9 Female (5) 5-Pin DIN Female	SW783A	**$670.00**
8 to 1	(8) DB9 Male (1) DB9 Female (9) 5-Pin DIN Female	SW786A	**$1180.00**
12 to 1	(12) DB9 Male (1) DB9 Female (13) 5-Pin DIN Female	SW784A	**$1385.00**

remember to order cables

VGA Monitor to Videolink Cable
EHM028-0001 **$32.30**

VGA Card to K/V Switch Cable
EHM029-0010 **$43.05**

6-Pin Mini DIN Male to 5-Pin DIN Female Adapter
FA211 **$5.95**

6-Pin Mini DIN Female to 5-Pin DIN Male Adapter
FA212 **$5.95**

5-Pin DIN Cable, 10-ft. (3.0-m) Male/Male
EVMBDC-0010-MM **$15.95**
For other lengths and genders, see p. 92.

Video EGA Cable, 10-ft. (3.0-m) PVC
EHM005-0010-MM **$27.95**
For other lengths and genders, see p. 91.

Macintosh Keyboard/Video Switch

Control up to 12 Macintosh CPUs from One Site.

- **Access multiple Macintosh CPUs—including LAN servers, routers, and bridges—from one keyboard and monitor.**
- **Switch between 4, 8, or 12 CPUs up to 20 feet (6.1 m) away.**

The Macintosh® Keyboard/Video Switch controls multiple Mac® computers from one location and maintains power to your keyboard. You never have to reset the computer. Any active CPU can supply power to the keyboard.

Your CPUs—4, 8, or 12 of them—can be up to 20 feet (6.1 m) away. You can daisychain the Switches, too. To set up the Switch, you just connect it to the CPUs, monitor, and keyboard. Then set the Switch's internal jumpers for the CPUs you're using. Switch between them with front-panel pushbuttons. An LED on the Switch's front panel tells you which CPU you're connected to.

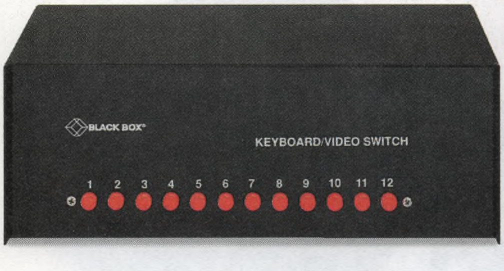
Item		Code	Price
Macintosh Keyboard/Video Switch	4 to 1	SW937A	**$750.00**
	8 to 1	SW938A	**$1250.00**
	12 to 1	SW939A	**$1450.00**

remember to order **cables**

Order a keyboard and video cable for each device connected to the Switch:

Item		Code	Price
Keyboard Extension Cable (4-Pin Mini DIN M-M)			
	6-ft. (1.8-m)	EVMK4B-0006-MM	**$14.95**
	10-ft. (3.0-m)	EVMK4B-0010-MM	**$18.95**
RGBS Video Cable DB15M-DB15M,	6-ft. (1.8-m)	EVMA14	**$11.95**

For other lengths and genders, see p. 112.



SPECIFICATIONS

Distance — Up to 20 feet (6.1 m)
System Requirements — Any Macintosh computer
CE Approval — All items listed are approved
Connectors — All models: Video: (1) DB15 female;
SW937A: (5) DB15 female, (5) 4-pin mini DIN female;
SW938A: (9) DB15 female, (9) 4-pin mini DIN female;
SW939A: (13) DB15 female, (13) 4-pin mini DIN female
Power — None required
Size — 3.5"H x 10.5"W x 5"D (8.9 x 26.7 x 12.7 cm)
Weight — 7 lb. (3.2 kg)

KVM Switch for Mac

Yes! Macintosh Users Can Share up to 4 CPUs from 1 Location.

- **Control 2 or 4 Mac CPUs from a single keyboard, monitor, and mouse.**

If your department relies on the ease of use that Macintosh computers bring to the workplace, managing your Mac CPUs can be just as easy—when you have the right KVM Switch.

The BLACK BOX® Macintosh KVM Switch comes in a 2- or 4-port model. Use the Switch to control either 2 or 4 Mac CPUs from just a single keyboard, monitor, and mouse.

These Switches are just right for managing small-sized departments—or for controlling your department's servers.

SPECIFICATIONS

CE Approval — All items listed are approved
Connectors — DB25 female: (1) for monitor/keyboard/mouse, (1) for each port to CPUs
Power — None required
Size — 2.3"H x 8.8"W x 4.9"D (5.7 x 22.4 x 12.5 cm)
Weight — 3 lb. (1.4 kg)

KVM Switch
BLACK BOX
(412) 746-5500
1 2 3 4
POWER

FAXBACK INFORMATION
Request Document Number: 13349
Call 412-746-5500 Anytime

Item		Code	Price
KVM Switch for Mac	2M	SW732A	**$395.00**
	4M	SW733A	**$495.00**

remember to order **cables**

Item	Code	1-ft. (0.3-m)	5-ft. (1.5-m)	10-ft. (3-m)	20-ft. (6-m)
Cable from CPU to KVM Switch	EHN104	**$25.00**			
Cable from KVM Switch to Keyboard	EHN105		**$33.00**	**$43.00**	**$63.00**

Keyboard/Video Switches for Macintosh

Just Turn the Knob for Low-Cost Mac Sharing.

- Connect 2, 4, 6, 8, 10, or 12 Macintosh® CPUs.
- Control each CPU from one keyboard/monitor station.
- Our lowest-cost standalone Mac® sharing Switch.

ABSOLUTELY GUARANTEED FOR LIFE
A B
ABC SWITCH
BLACK BOX
B C A

SPECIFICATIONS

Leads Supported — All pins
Connectors — 3, 5, 7, 9, 11, or 13 of each of the following: 4-pin mini DIN female, DB15 female
Size — Standalone model: 3.5"H x 6"W x 6.3"D (8.9 x 15.2 x 16 cm);
Rackmount models: 3.5"H x 19"W x 5.9"D (8.9 x 48.3 x 15 cm)
Weight — Standalone model: 1.4 lb. (0.6 kg);
Rackmount models: 8.4 lb. (3.8 kg)

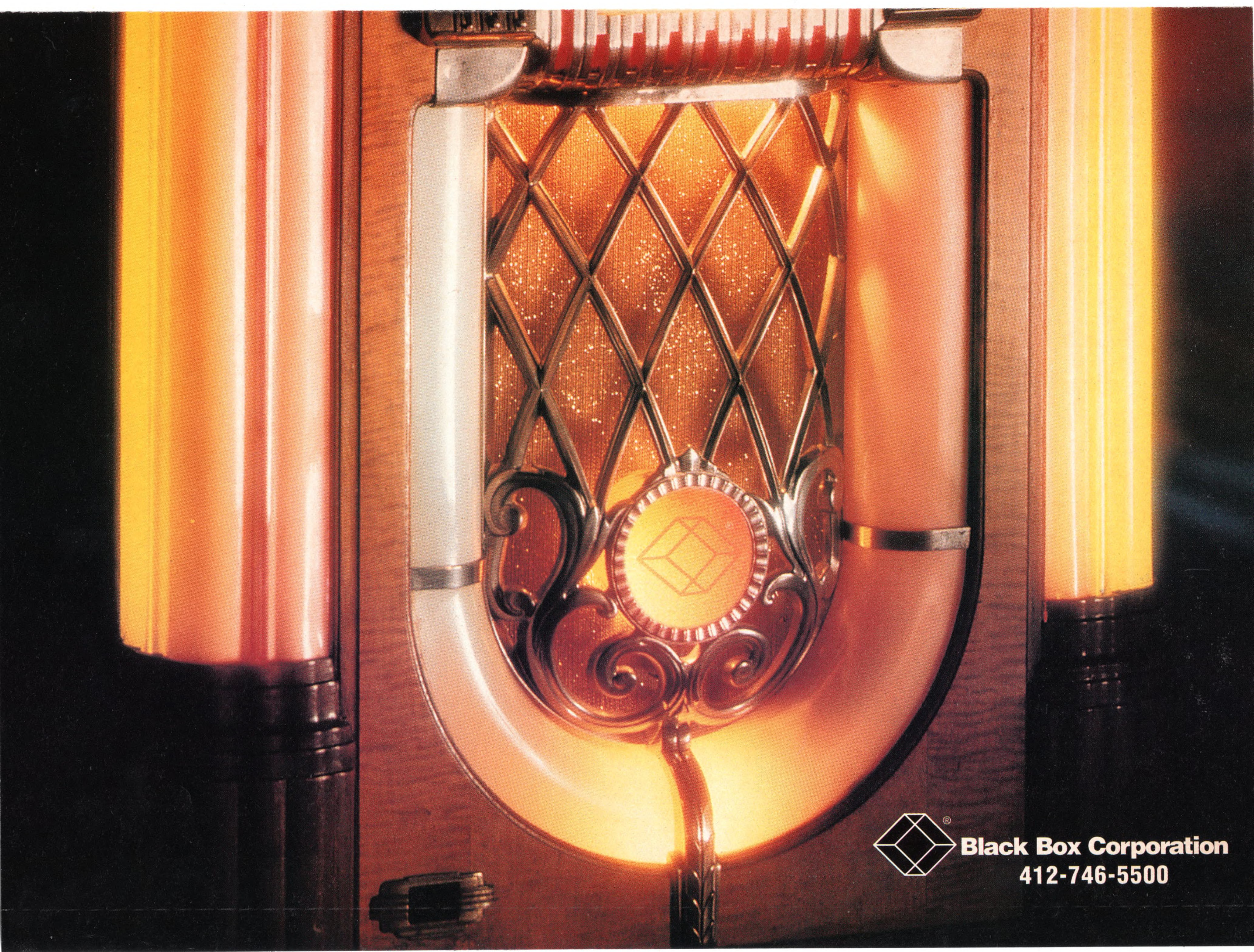
Item	Code	Price
Standalone Keyboard/Video Switch for Macintosh		
2 to 1	SW016A	**$176.00**
Rackmount Keyboard/Video Switches for Macintosh		
4 to 1	SR013A	**$268.00**
6 to 1	SR014A	**$298.00**
8 to 1	SR016A	**$330.00**
10 to 1	SR021A	**$456.00**
12 to 1	SR022A	**$467.00**

remember to order **cables** ***Order a keyboard and video cable for each device connected to the Switch:***

Item	Code	Price
Keyboard Extension Cable (4-Pin Mini DIN M-M)		
6-ft. (1.8-m)	EVMK4B-0006-MM	**$14.95**
10-ft. (3.0-m)	EVMK4B-0010-MM	**$18.95**
RGBS Video Cable DB15M-DB15M, 6-ft. (1.8-m)	EVMA14	**$11.95**

For other lengths and genders, see p. 112.

The Hits Keep Coming!
BLACK BOX®
ServSwitch™
technology
ServSwitch Basic
ServSwitch Jr.
ServSwitch
ServSwitch for Sun®
ServSwitch for Mac®
ServManager
ServSelect
ServSwitch Ultra
Matrix ServSwitch
ServMaster
ServSwitch Multi
ServSwitch Bus Mouse
BLACK BOX®
MAKE SELECTION



Black Box Corporation
412-746-5500

The Hits Keep Coming!

BLACK BOX ServSwitch technology
ServSwitch Basic
ServSwitch Jr.
ServSwitch
ServSwitch for Sun
ServSwitch for Mac
ServManager
ServSelect
ServSwitch Ultra
Matrix ServSwitch
ServMaster
ServSwitch Multi
ServSwitch Bus Master
BLACK BOX

BLACK BOX® ServSwitch™ technology

The BLACK BOX® ServSwitch is a number-one hit. And no wonder!

Black Box customers just love the way the ServSwitch helps them save money, save space, and save time by enabling them to control multiple CPUs from a single keyboard, monitor, and mouse.

In fact, Black Box customers love the BLACK BOX® ServSwitch so much, they've made it the industry standard for managing network servers.

And at Black Box, we stay on the cutting edge of ServSwitch technology. As the technology evolves, we bring you even better ServSwitches—ServSwitches that are more cost-effective, more versatile, and even easier to use.

So you can always count on Black Box for the biggest variety, the best values, and the very latest in ServSwitches.

At Black Box, the ServSwitch hits just keep on coming.

FEATURES LEGEND

🟨 Up to 10 Feet	🟩 Up to 200 Feet	🟧 Daisy-Chainable	🟦 Flash-ROM Upgradable
🟥 Mouse Conversion	🟪 Keyboard/ Mouse Reset	🟫 On-Screen Menus	Modular Expansion

🟨 Up to 10 Feet
- Connect your CPUs and workstation up to 10 feet away from the Switch.

🟩 Up to 200 Feet
- Coax cable connects your CPUs and workstation up to 100 feet away from your Switch!
- Combine coax cable with our Station Extenders to go up to 200 feet.

🟧 Daisy-Chainable
- ServSwitches can be connected together to keep pace with your expanding network.

🟦 Flash-ROM Upgradable
- With Flash-ROM, your ServSwitches are "obsolescence-proof"—always compatible with new technologies.

🟥 Mouse Conversion
- A PS/2® mouse can be used to control CPUs with either PS/2 or serial mouse connections.

🟪 Keyboard/ Mouse Reset
- This feature enables the mouse and keyboard to be reset without having to reboot the CPU.

🟫 On-Screen Menus
- Configure CPU, keyboard, and mouse types.
- Identify and select CPUs quickly and easily.

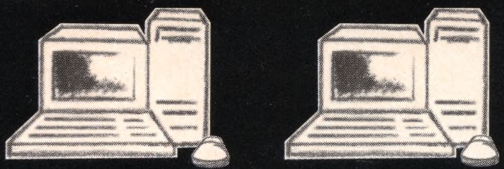
Modular Expansion
- To add workstations or CPUs, just slide in another module!
- Add or change modules without shutting down the Switch!

Single-Use

PLATFORMS	Standard ServSwitch Controls		Optional On-Screen M	
PC	🟨 🟧 **ServSwitch Basic** (See **p. 276**)	🟩 🟥 🟪 **ServSwitch Jr.** (See **p. 276**)	🟩 🟧 🟦 🟥 🟪 🟫 **ServSwitch** (See **p. 277**)	🟩 🟥 🟪 **Serv** (Se
Sun®	 **ServSwitch for Sun®** (See **p. 277**)	🟩 🟧 🟪		🟩 🟥 🟪 **ServManager** (See **p. 278**)
Mac®	 **ServSwitch for Mac®** (See **p. 277**)	🟩 🟧 🟪		🟩 🟥 🟪 **ServManager** (See **p. 278**)
Multi-Platform Supports PC, Sun, & Mac				🟩 🟥 🟪 **ServManager** (See **p. 278**)

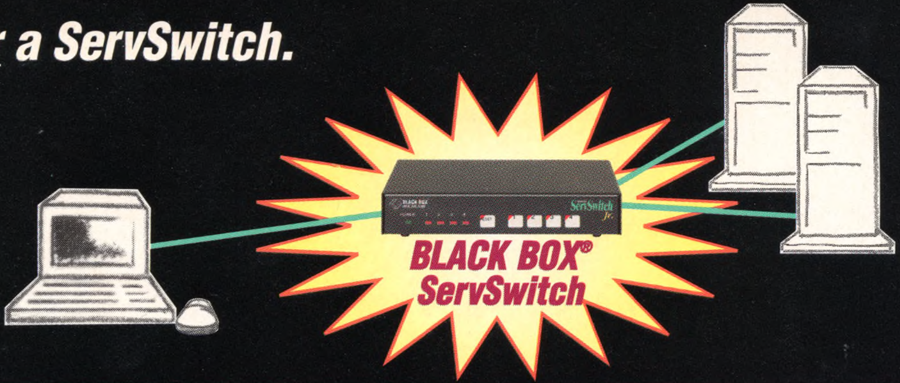
The Old Way: Before a ServSwitch.

You have a problem: You want to add another computer— but a new mouse, keyboard, and monitor are incredibly expensive.



The New Way: After a ServSwitch.

With a BLACK BOX® ServSwitch, you can slash costs. Control multiple CPUs from one central location without the added expense of mice, keyboards, and pricey monitors.



ser

n Menus

ervManager
(See **p. 278**)

On-Screen Menus

ServSelect
(See **p. 279**)

ServSwitch Ultra for PC
(See **p. 280**)

ServSwitch Ultra for Sun
(See **p. 280**)

ServSwitch Ultra Multi
(See **p. 280**)

ServSwitch Ultra Multi
(See **p. 280**)

Multi-User

Standard ServSwitch Controls

Matrix ServSwitch
(See **p. 281**)

ServMaster
(See **p. 281**)

Confused about the Best ServSwitch for Your Needs?

Give our Expert Technical Support Staff a call and they'll point you in the right direction. Plus, they're available 24 hours a day, 7 days a week, so you can reach them whenever *you* need them.

TECH SUPPORT
OUR BEST PRODUCT!

Optional On-Screen Menus

ServSwitch Multi
(See **pp. 282–283**)

ServSwitch Multi
(See **pp. 282–283**)

ServSwitch Multi
(See **pp. 282–283**)

ServSwitch Multi
(See **pp. 282–283**)

Space-Saving KVM Switch for Sun

Access up to 4 Sun Workstation CPUs from a Single Keyboard, Monitor, and Mouse.

Sun®
BLACK BOX®
(412) 746-5500
KVM Switch
1
2
3
4
POWER

- **Choose 2- or 4-port models.**
- **Automatic boot-up.**
- **Slim rackmountable case.**
- **DB25 3-to-1 cables save space.**

Control either 2 or 4 Sun® CPUs from a single keyboard, monitor, and mouse—with the KVM Switch for the Sun Workstation®.

These Switches for Sun CPUs are just right for managing small departments—or for controlling a handful of servers. For convenience and control, these are the Switches of choice for Sun platform users.

Both models also come with automatic boot-up so all of your Sun CPUs are ready for work when you are.

SPECIFICATIONS

CE Approval — All items listed are approved
Connectors — DB25 female: (1) for monitor/keyboard/mouse, (1) for each port to CPUs
Power — From the interface
Size — 2.3"H x 8.8"W x 4.9"D (5.7 x 22.4 x 12.5 cm)
Weight — 3 lb. (1.4 kg)

FAXBACK INFORMATION
Request Document Number: 13349
Call 412-746-5500 Anytime

NOTE: If you want to switch from your workstation as well as directly from the switch, check out our ServSwitch for Sun on ***page 277****.*

Item		**Code**	**Price**
KVM Switch for Sun	2S	SW734A	**$395.00**
	4S	SW735A	**$495.00**

remember to order cables

Item	**Code**	**1-ft. (0.3-m)**	**5-ft. (1.5-m)**	**10-ft. (3-m)**	**20-ft. (6-m)**
Cable from Keyboard/Mouse and Monitor	EHN102	**$91.00**			
Cable from Sun Workstation	EHN103		**$105.00**	**$123.00**	**$158.00**

Original Keyboard/Video Switches for Sun Workstation

Access up to 8 Sun Workstation CPUs from a Single Keyboard, Monitor, and Mouse.

Sun®
BLACK BOX®
KEYBOARD/VIDEO SWITCH
1
2
3
4
5
6
7
8

- **Connect up to eight Sun Workstation models using standard Sun cables.**
- **Control each Workstation from one keyboard/monitor station.**
- **Automatic boot-up for Sun CPUs.**

Get control of your Sun CPUs with the BLACK BOX® Keyboard/Video Switch for Sun Workstation. It's perfect for managing servers, gateways, routers, or bridges. Command up to eight CPUs for trade shows, demos, training, and more—wherever you need convenient, centralized control.

NOTE: If you want to mix platforms and also switch between CPUs directly from your workstation, check out our ServManager on ***page 278****.*

FAXBACK INFORMATION
Request Document Number: 13538
Call 412-746-5500 Anytime

SPECIFICATIONS

CE Approval — All items listed are approved
Connectors — Keyboard: Mini DIN-8 female; Video: 13W3 female
Power — From the interface
Size — 3.5"H x 10.5"W x 5"D (8.9 x 26.7 x 12.7 cm)

Item	**Code**	**Price**
Keyboard/Video Switches for Sun Workstation		
4 to 1	SW790A	**$895.00**
8 to 1	SW791A	**$1395.00**
remember to order cables Video Cable 13C3, 10-ft. (3.0-m) Male/Male	EVMVDT02-0010-MM	**$106.00**
For other lengths and genders, see p. 93.		
PS-2 Keyboard Replacement Cable	EVNPS02	**$28.00 + $0.27/ft.**
For more information, see p. 92.		

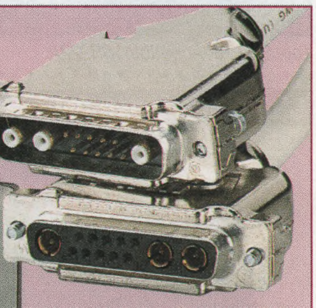
Don't Miss the Rest of Our Products and Accessories for Sun!

Black Box has a growing line of products to expand the capabilities of your Sun Workstation.

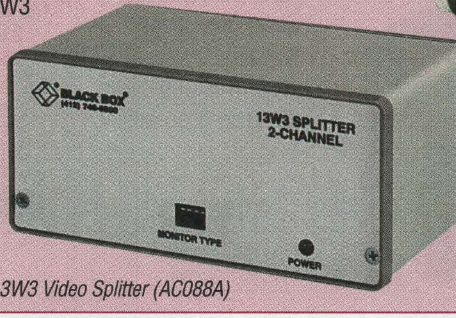
For in-house conferences and demonstrations that everyone will remember, consider our 13W3 Video Splitters (see **page 226**). These Splitters can display your video on up to four 13W3 monitors—at distances up to 200 feet (61 m) away. And with their 300-MHz bandwidth, you get sharp images. You can even cascade the Splitters for more elaborate setups!

Need to manage your Sun Workstation in mixed environments with PCs and Mac®? Our ServManager (**page 278**) is up to the task! With the convenient built-in keypad and display, you can supervise multiple servers from one location.

For networking applications, be sure to see our High-Speed 100-Mbps Ethernet products (**pages 474–499**).



Video Cable 13C3 (EVMVDT02)



13W3 Video Splitter (AC088A)

Sun®

Black Box Explains...

How to Select the Right Video Switch.

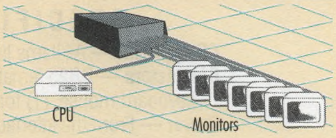
Which Connector Style?

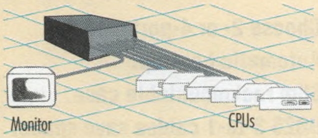
Before you select a Video Switch, check which connector style is used with your video equipment. For example, if you need a switch for VGA monitors, your connector is a female DB15HD.

It's easy to find out which connector style your equipment uses. Just look for the connector icon with each Video Switch on these next two pages.

How Many Devices Can I Connect?

Manual video switches can usually connect up to 6 devices. To switch between more CPUs, see our ServSwitches on **pages 270–287**.





Which Chassis Style?

A

Standalone Chassis Style

Size — 2.5"H x 6"W x 6.3"D (6.4 x 15.2 x 16 cm)
Weight — 1.5 lb. (0.7 kg)

B

Standalone Chassis Style

Size — 3.5"H x 6"W x 6.3"D (8.9 x 15.2 x 16 cm)
Weight — 2 lb. (0.9 kg)

C

Standalone Chassis Style

Size — 3.5"H x 19"W x 5.9"D (8.9 x 48.3 x 15 cm)
Weight — 8.4 lb. (3.8 kg)

D

Rackmountable Chassis Style

Size — 3.5"H x 19"W x 5.9"D (8.9 x 48.3 x 15 cm)
Weight — 8.4 lb. (3.8 kg), rackmount ears

GUARANTEED FOR LIFE

Video Switches (Manual)

remember to order cables
Video Cables, see pp. 90–95.

RGBS Video-Only Switch

Top: SWL575A; Bottom: SW951A

- Connect up to four RGBS monitors to one PC or Mac®.

BNC Coaxial

Item	Chassis Style	Code	Price
RGBS Video-Only Switch			
2 to 1	B	SWL575A	$89.95
3 to 1	C	SW951A	$320.00
	D	SR951A	$320.00
4 to 1	C	SW950A	$360.00
	D	SR950A	$360.00
remember to order cables RGBS Video Cable, 10-ft. (3.0-m) Male/Male		EYNRGBS2-0010-MM	$64.95

For other lengths and genders, see p. 93.

◆ ◆ ◆

VGA & SVGA Switch

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!

Top: SWL780A; Bottom: SR922A

- For all VGA and Super VGA video connections.
- The Ready Pak comes with two 10-ft. VGA Video Extension Cables (EVNPS05-0010-MM).

DB15HD female

Item	Chassis Style	Code	Price
VGA & SVGA Switch			
2 to 1	A	SWL780A	$69.00
Ready Pak Includes: the Switch **plus** (**2**) 10-ft. VGA Video Extension Cables		SWL780A-FFF-CABPAK	$138.90
3 to 1	B	SW922A	$157.00
	D	SR922A	$225.00
4 to 1	B	SWL785A	$79.00
5 to 1	B	SW921A	$250.00
	D	SR921A	$315.00
6 to 1	B	SW920A	$290.00
	D	SR920A-R2	$355.00
X (2 to 2)	A	SW788A	$164.00
remember to order cables VGA Video Extension Cable, 10-ft. (3.0-m) Female/Female		EVNPS05-0010-FF	$34.95

For other lengths and genders, see p. 91.

◆ ◆ ◆

CGA & EGA Video-Only Switch

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!

SWL031A

- For all CGA and EGA video connections.
- The Ready Pak comes with three 10-ft. DB9 Cables (EDN12H-0010-MF).

DB9S female

Item	Chassis Style	Code	Price
CGA & EGA Video-Only Switch			
2 to 1	A	SWL030A	$45.00
Ready Pak Includes: the Switch **plus** (**3**) 10-ft. DB9 Cables		SWL030A-FFF-CABPAK	$113.85
4 to 1	A	SWL031A	$69.95
6 to 1	B	SW035A	$143.00
X (2 to 2)	A	SW033A	$118.00
remember to order cables Video EGA Cable, 10-ft. (3.0-m)		EHM005-0010	$27.95

For other lengths, see p. 91. Specify gender when ordering.

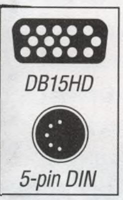
ABSOLUTELY GUARANTEED FOR LIFE

Keyboard/Video Switches (Manual)

PC with VGA Switch

- For your IBM® PC-style keyboard with VGA video.
- Up to 6 CPUs.
- The Ready Pak comes with two 10-ft. PS-2 Keyboard Replacement Cables (EVNPS02-0010-MM) and two 10-ft. 5-Pin DIN Cables (EVMBDC-0010-MM).

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!



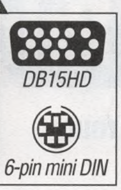
Top: SWL032A; Bottom: SW932A-R2

Item	Chassis Style	Code	Price
PC with VGA Switch			
2 to 1	B	SWL032A	**$89.95**
Ready Pak includes: the Switch **plus** (**2**) 10-ft. PS-2 Keyboard Replacement Cables **and** (**2**) 10-ft. 5-Pin DIN Cables		SWL032A-CABPAK	**$191.75**
3 to 1	B	SW933A-R3	**$295.00**
	D	SR933A-R2	**$320.00**
4 to 1	C	SW932A-R2	**$335.00**
	D	SR932A-R2	**$335.00**
5 to 1	C	SW931A-R2	**$385.00**
	D	SR931A-R2	**$385.00**
6 to 1	C	SW930A-R2	**$425.00**
	D	SR930A-R2	**$425.00**
remember to order cables: 5-Pin DIN Cable 10-ft. (3.0-m) Male/Male		EVMBDC-0010-MM	**$15.95**
		For other lengths and genders, see p. 92.	
VGA Video Extension Cable		EVNPS05-0010-FF	*See page 91.*

PS/2 Style Keyboard with VGA Switch

- For your PS/2® style keyboard with VGA video.
- Up to 6 CPUs.
- The Ready Pak comes with two 10-ft. VGA Cables (EVNPS05-0010-MM) and two 10-ft. 6-Pin Mini DIN Cables (EVMPS03-0010-MM).

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!

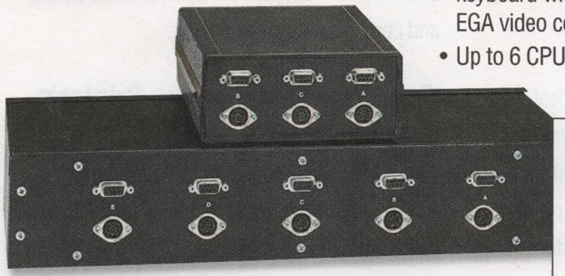


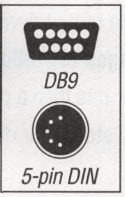
Top: SW913A; Bottom: SW914A

Item	Chassis Style	Code	Price
PS/2 Style Keyboard with VGA Switch			
2 to 1	B	SW779A	**$145.00**
Ready Pak includes Switch **plus** (**2**) 10-ft. VGA Cables **plus** (**2**) 10-ft. 6-Pin Mini DIN Cables		SW779A-CABPAK	**$266.80**
3 to 1	B	SW913A	**$295.00**
	D	SR913A	**$325.00**
4 to 1	C	SW915A	**$365.00**
	D	SR915A-R2	**$365.00**
5 to 1	C	SW911A	**$460.00**
	D	SR911A-R2	**$460.00**
6 to 1	C	SW914A	**$515.00**
	D	SR914A-R2	**$515.00**
remember to order cables: 6-Pin Mini DIN Cable, 10-ft. (3.0-m) Male/Male		EVMPS03-0010-MM	**$25.95**
		For other lengths and genders, see p. 92.	
VGA Video Extension Cable, 10-ft. (3.0-m) Female/Female		EVNPS05-0010-FF	**$34.95**
		For other lengths and genders, see p. 91.	

PC with CGA/EGA Video Switch

- For your IBM style keyboard with CGA or EGA video connections.
- Up to 6 CPUs.





Top: SW012A; Bottom: SW942A-R2

Item	Chassis Style	Code	Price
PC with CGA/EGA Video Switch			
2 to 1	A	SW012A	**$133.00**
3 to 1	B	SW943A-R2	**$170.00**
	D	SR943A-R2	**$240.00**
4 to 1	C	SW942A-R2	**$295.00**
	D	SR942A-R2	**$295.00**
5 to 1	C	SW941A-R2	**$340.00**
	D	SR941A-R2	**$340.00**
6 to 1	C	SW940A-R2	**$360.00**
	D	SR940A-R2	**$360.00**
remember to order cables: 5-Pin DIN Cable, 10-ft. (3.0-m) Male/Male		EVMBDC-0010-MM	**$15.95**
		For other lengths and genders, see p. 92.	
VGA Video Extension Cable, 10-ft. (3.0-m) Female/Female		EVNPS05-0010-FF	**$34.95**
		For other lengths and genders, see p. 91.	

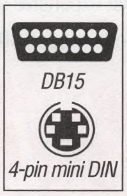
Keyboard/Video Switches for Macintosh

- Connect 2, 4, 6, 8, 10, or 12 Macintosh® CPUs.
- Up to 12 CPUs.

A B
ABC SWITCH
BLACK BOX

Mac

SW016A; Front and Rear views



Item	Chassis Style	Code	Price
Standalone Keyboard/Video Switch for Macintosh			
2 to 1	B	SW016A	**$176.00**
Rackmount Keyboard/Video Switches for Macintosh			
4 to 1	D	SR013A	**$268.00**
6 to 1	D	SR014A	**$298.00**
8 to 1	D	SR016A	**$330.00**
10 to 1	D	SR021A	**$456.00**
12 to 1	D	SR022A	**$467.00**
remember to order cables: Keyboard Extension Cable (4-Pin Mini DIN Male/Male) (**p.112**)			
6-ft. (1.8-m)		EVMK4B-0006-MM	**$14.95**
10-ft. (3.0-m)		EVMK4B-0010-MM	**$18.95**
DB15M-DB15M RGBS Video Cable (**p.112**)			
6-ft. (1.8-m)		EVMA14	**$11.95**
12-ft. (3.7-m)		EVMA15	**$13.95**

Sharing.

An Old-Fashioned Idea that Can Save You a Bundle in Printer Costs.

Sharing Makes Sense.

You learned to share in kindergarten. The old sharing rule makes sense with your office printers, too. Because when you share a printer, you save money. Black Box can help you share printers with the least possible inconvenience and expense—and without a network.

Black Box can help you make the most of your printers in other ways, too, with buffers, spoolers, interface converters, and extenders. Just take a look at all the printer solutions from Black Box:

Converters—Working Together.

You can make your serial and parallel devices work together with BLACK BOX® Serial↔Parallel Converters (**pages 296–297**).

These Printer Devices eliminate serial-parallel incompatibility between your printer and your PC. You can use serial printers with parallel PC ports, or parallel printers with serial ports.

Extenders—Reach Your Faraway Printer.

Are you frustrated by distance limits? Get our Extenders (**page 298**)—and send documents up to 1000 feet or more.

Buffers—Quick on the Take.

They're quick, that's for sure—and ideal for single CPUs linked to a single output device.

BLACK BOX® Buffers (**pages 299–300**) accept data from your PC at a faster rate than a printer can actually print—and they store your data until the printer is ready.

When you have a Buffer, your CPU's free to do more work. That's because our Buffers are quick on the take—with your print jobs.

Switches—Simple Solutions.

A Printer Switch from Black Box can be one of the most practical and least expensive solutions to simple printer-sharing needs (**pages 301–303**).

Sharers—Safe Speeding for Everybody's Print Jobs.

Use BLACK BOX® Print-Sharers (**pages 304–309**) and get the cost savings of sharing premium printers without the expense and complications of a network.

Spoolers—Remove the Printer's Shackles from Your CPUs.

Practically everyone in the office sent their jobs to the printer ahead of you. So you sit. And you wait. All the while, your CPU is held prisoner by the printer.

You need a Spooler (**pages 310–313**) from Black Box. It accepts files from multiple PCs and stores them in a print queue until the printer is free.

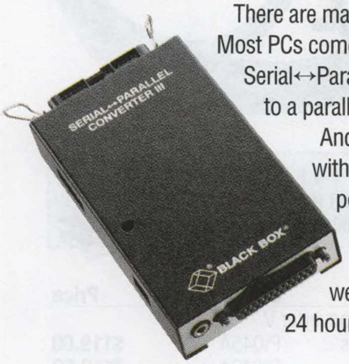
Questions? Call us.

Black Box Technical Support is always here to answer your questions and to help you select the most cost-effective and convenient printer solution.

BLACK BOX

SOLUTIONS Free 24-Hour Expert Tech Support.

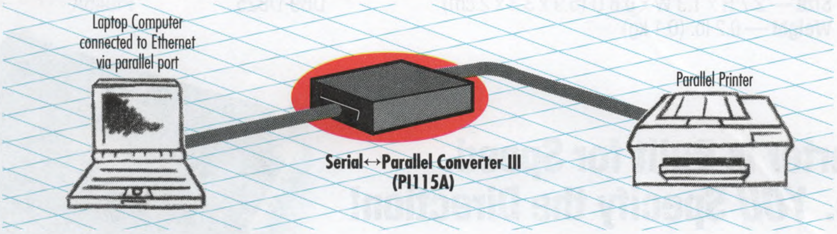
"My laptop is connected to our Ethernet network through its only parallel port. How can I stay connected to the network and also print to a laser printer?"



There are many options. But Black Box has a simple, *affordable* solution for you. Most PCs come with two serial ports and one parallel port. We recommend our Serial↔Parallel Converter III (**page 297**) to convert one of the unused serial ports to a parallel port for the laser printer.

And should your needs change in six months, the Converter can change with you. With the flip of an internal DIP switch, you can change a parallel port to a serial one.

There's no need to get frustrated with your computer equipment when Black Box is just a phone call away. No problem is too small—we're here to help you. And as always, Technical Support is free, 24 hours a day, 7 days a week.



Serial↔Parallel Converter III (PI115A)

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BLACK BOX

SOLUTIONS Over 7000 Connectivity Solutions!

"I like the idea of sharing a printer among several PCs, but our office is expanding. Is there a printer-sharing solution that will grow with us?"

The Modprint Print-Sharer (**page 308**) is a versatile, easy-to-install sharing solution for any combination of up to 32 PCs and parallel printers. Plug-in modules and lightweight RJ-11 cable make Modprint extraordinarily adaptable to changing office environments. To add another PC or printer, just plug in another module.

Modprint is easy on users, too. With a single printer, it's completely transparent to the users. With multiple printers, users select a printer from a simple pop-up window.

At Black Box, we have over 7000 connectivity solutions and we're ready to help find one for you!

MODPRINT
For IBM PC®/AT®/System 2® and compatibles.
Utilities Disk
BLACK BOX
MODPRINT COMPUTER MODULE
MODPRINT PRINTER MODULE

FOR *FAST* TECH SUPPORT,
Call **412-746-5500**

PRESS **1,2,2** CONNECTIVITY
Printer Devices, Cables/Connectors, Switches, Tools/Racks, Equipment Protection/Testers

Or if You Prefer:
Fax Us at: 412-746-0746.
E-mail Us at: info@blackbox.com

Serial↔Parallel Converter V

Easy Conversion—No Extra Cable to Buy.

- **Converts serial and parallel bidirectionally.**
- **Automatic serial/parallel mode detection.**
- **Runs at speeds up to 38.4 Kbps.**
- **Interface-powered—no AC outlets needed.**
- **Built-in 6-foot (1.8-m) cable eliminates the need for extension cables.**

You'd like to connect your PC to a printer but…oops…you already have something plugged into your parallel port. Black Box brings you the solution—the Serial↔Parallel Converter V makes the DB9 serial port on your PC compatible with parallel devices.

It's compact and easy-to-use and it packs a lot of power. Use it to send serial data to a printer as fast as 38.4 Kbps (switch-selectable). It automatically orients itself for serial-to-parallel or parallel-to-serial. All you have to do is set the DIP switches to define the serial parameters.

Best of all, since the Converter draws power directly from the RS-232 interface, you can use it anywhere. No AC outlet required!

Here's an added benefit—there are no extra cables to order. Period! That's because the Converter includes an integral 6-ft. (1.8-m) cable with a DB9 female socket for serial ports and either a Centronics® or DB25 male plug on the other end.

FAXBACK INFORMATION
Request Document Number: 14230
Call 412-746-5500 Anytime

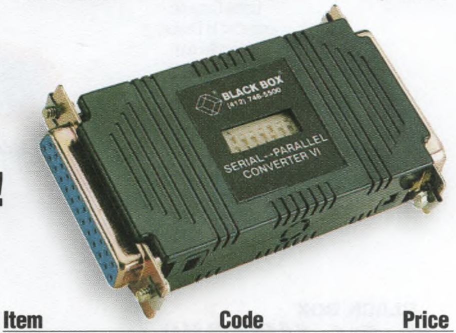
SPECIFICATIONS

Controls — External DIP switches: speed, flow control, parity, word length
Data Format — Even, odd, or no parity; 7 or 8 data bits, one stop bit
Flow Control — Hardware or X-ON/X-OFF
Speed — 300 bps to 38.4 Kbps, switch-selectable
CE Approval — All items listed are approved
Interface — Asynchronous serial, Centronics parallel
Connectors — Both: (1) DB9 female, DCE; PI045A: (1) Centronics male; PI046A: (1) DB25 male, DTE
Indicators — (1) LED
Power — From the RS-232 interface
Size — 2.7"H x 1.3"W x 0.8"D (6.9 x 3.3 x 2 cm)
Weight — 0.2 lb. (0.1 kg)

Item	Code	Price
Serial↔Parallel Converter V		
DB9-Centronics	PI045A	**$119.00**
DB9-DB25	PI046A	**$119.00**

Serial↔Parallel Converter VI

This Serial↔Parallel Converter Is Built for Speed. Send Data up to 115.2 Kbps. *YOU* Specify the Direction!



This Converter's incredible 115.2-Kbps speed makes it the perfect choice for linking PCs to high-speed printers, plotters, or any async device.

Forget complicated setups. Just set the switch to convert from serial to parallel or parallel to serial. Control other configurations using the external DIP switches. It draws power directly from the DTE interface so you can plug it in-line anywhere.

FAXBACK INFORMATION
Request Document Number: 14247
Call 412-746-5500 Anytime

SPECIFICATIONS

Data Format — 7 or 8 data bits
Diagnostics — Self test
Flow Control — Hardware handshaking; Software X-ON/X-OFF
Protocol — Async
CE Approval — Yes
Interface — RS-232 serial and Centronics® parallel
Connectors — (1) DB25 female; (1) DB25 female, (F/F gender changer—included)
Power — Serial: Pins 4 and 20; Parallel: Pin 10
Size — 3.2"H x 2"W x 0.8"D (8.1 x 5.1 x 2 cm)
Weight — 1 lb. (0.5 kg)

Item	Code	Price
Serial↔Parallel Converter VI	PI130A	**$119.00**
For serial→parallel applications: Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**
For other lengths and genders, see p. 106.		
For parallel→serial applications: RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83. *Specify gender when ordering.*		

remember to order **cables**

Serial↔Parallel Converter IV

Go Mobile! Convert Serial or Parallel—Wherever You Are.

- **Interface powered—no separate power supply.**
- **Eight-position DIP switch.**

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!

This compact, durable unit is perfect for laptop users. Set the data rate from 300 bps to 38.4 Kbps. Includes one DB25 female-to-female adapter—so you can use standard PC serial or parallel printer cables.

The Ready Pak also comes with one 6-ft. Parallel Printer Cable (EYN600-0006-MM).

SPECIFICATIONS

Control — (1) 8-position DIP switch
Flow Control — X-ON/X-OFF, DTR/CTS
Memory — 32 bytes
CE Approval — Yes
Interface — RS-232 serial and Centronics parallel; Pins 4 and 20 required for power on serial port, Pin 10 required for power on parallel port
Connectors — RS-232: (1) DB25 female; Centronics: (1) DB25 male; also includes (1) DB25 female-to-female gender adapter
Power — From the attached computer devices
Size — 0.6"H x 3.5"W x 2.1"D (1.5 x 8.9 x 5.3 cm)
Weight — 0.1 lb (<0.1 kg)

Item	Code	Price
Serial↔Parallel Converter IV	PI125A	**$95.00**
Ready Pak Includes: the Converter **plus** (1) 6-ft. Parallel Printer Cable	PI125A-CABPAK	**$108.95**
You may also need:		
AT Serial Adapter (DB25 Male to DB9 Male)	FA520A-R2	**$11.95**
Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**
For other lengths and genders, see p. 106.		
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83. *Specify gender when ordering.*		

remember to order **cables**

Serial↔Parallel Converter III

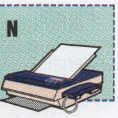
The Serial↔Parallel Converter for *Fast* Machines.

- **Perfect for *fast* equipment—25 MHz and *up*.**
- **Switch-selectable for DCE/DTE and serial/parallel conversion.**

Use our popular Serial↔Parallel Converter to link faster computing equipment—25 MHz and up. Use one unit for either conversion—serial to parallel, or parallel to serial. Just flip a switch to choose the direction of the conversion, DCE or DTE, and the speed—from 300 bps up to 38.4 Kbps.

The Ready Pak comes equipped with (1) 6-ft. DB9F/DB25M Serial Printer Cable (EVMBPC-0006) and (1) 5-ft. Centronics® Cable (EQN380-0005-MM).

FAXBACK INFORMATION
Request Document Number: 13435
Call 412-746-5500 Anytime



CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!

SPECIFICATIONS

Data Format — 7 data bits, even or odd parity; 8 data bits, no parity
Flow Control — Serial: Hardware handshaking (Pins 5, 6, 8, or 11, 19, 20), Software: (X-ON/X-OFF); Parallel: Hardware (Busy, Acknowledge)
Memory — 65 bytes
CE Approval — 230-VAC version: PI115AE
Connectors — (1) DB25 female, (1) Centronics type 36-pin female
Indicators — Ready LEDs
Power — 115 VAC (input), 9 VDC (output), 5 watts (wallmount power supply included)
Size — 1"H x 4"W x 3"D (2.5 x 10.2 x 7.6 cm)
Weight — 1 lb. (0.5 kg)

Item	Code	Price
Serial↔Parallel Converter III	PI115A	$135.00
Ready Pak Includes: the Converter **plus** (**1**) 6-ft. DB9F/DB25M Serial Printer Cable **and** (**1**) 5-ft. Centronics Cable	PI115A-CABPAK	$176.25

remember to order cables

Item	Code	Price
AT Serial Printer Cable, 6-ft. (1.8-m), DB9F/DB25M	EVMBPC-0006	$8.95

For other lengths, see p. 108.

Serial↔Parallel Converter (128K)

The Serial↔Parallel Converter with a 128-KB Buffer!

- Switch-selectable for DCE or DTE and serial↔parallel conversion.
- Includes a 6-ft. (1.8-m) straight-pinned RJ-45 cable.
- Has a 128-KB buffer to spool print files.

SPECIFICATIONS

Controls — (3) External switches: (1) reset, (1) DTE/DCE, (1) 8-position DIP switch
Data Format — 7 data bits, even or odd parity; 8 data bits, no parity
Connectors — Parallel: (1) DB25 female; Serial: (1) RJ-45 female
Power — 9 VDC @ 0.5 A from 115-VAC, 60-Hz adapter
Size — 1"H x 4"W x 3"D (2.5 x 10.2 x 7.6 cm)
Weight — 1.5 lb. (0.7 kg)

Item	Code	Price
Serial↔Parallel Converter (128K)	PI035A	$155.00
Modular Adapters		
DB25M-RJ-45 (for Serial Printer)	FA080-R2	$10.50
DB25F-RJ-45 (for IBM® XT™ Serial Port PCs)	FA081-R2	$10.50
DB9F-RJ-45 (for the IBM AT® Commport)	FA082-R2	$10.50

remember to order cables

Item	Code	Price
RJ-45 (8-Wire) Modular Cable, 7-ft. (2.1-m), Straight-Pinned	EL08MS-07	$4.95

For other lengths and pinnings, see p. 71.

Item	Code	Price
Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	$16.95

For other lengths and genders, see p. 106.

NOTE: See the listing at left for RJ-45 PVC modular cable runs and modular adapters.

Serial↔Parallel Converter for Dataproducts

Your PC Can Drive Your Dataproducts Printer.

- Run your Dataproducts® parallel printer from a PC serial port.
- Or run serial printers from your Dataproducts parallel ports.
- Configure speed (9600 bps to 38.4 Kbps), word structure, conversion direction, and DCE or DTE.
- Select the appropriate cable *free*.

NOTE: Some Dataproducts printers that have the long-lines interface or require external VFU loading are not compatible with this Converter.

SPECIFICATIONS

Data Format — 7 data bits, even or odd parity; 8 data bits, no parity
Flow Control — Hardware handshaking (Pins 4, 5, 6, 8, 11, or 20); X-ON/X-OFF on buffer full
Memory — PIB15A: 8 KB; PIB16A: 32 KB
CE Approval — 230-VAC versions: PIB15A-E, PIB16AE
Connectors — (1) DB25 female, (1) Centronics type 36-pin female
Power — 115 VAC, 9 VDC, 5 watts (wallmount power supply included)
Size — 1.5"H x 8"W x 6.3"D (3.8 x 20.3 x 16 cm)
Weight — 3 lb. (1.4 kg)

Item	Code	Price
Serial↔Parallel Converter for Dataproducts 8K Buffer	PIB15A	$440.00
Serial↔Parallel Converter for Dataproducts II 32K Buffer	PIB16A	$495.00

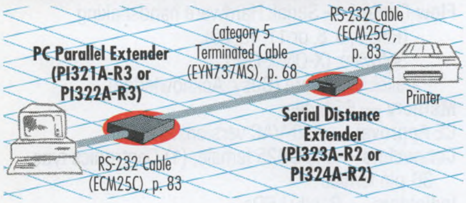
remember to order cables *Select the appropriate cable—FREE.*

Item	Code	Price
Adapter Cable "M" Block		
Serial↔Parallel	EYN328	NO CHARGE
Parallel↔Serial	EYN324	NO CHARGE
Adapter Cable DB50		
Serial↔Parallel	EYN322	NO CHARGE
Parallel↔Serial	EYN326	NO CHARGE

Parallel & Serial Extenders

Move Your Printers up to 4000 Feet Away from Your Terminals.

BLACK BOX
(412) 746-5500
Parallel Extender II
BLACK BOX
(412) 746-5500
Serial Extender II


PC Parallel Extender (PI321A-R3 or PI322A-R3)
Category 5 Terminated Cable (EYN737MS), p. 68
RS-232 Cable (ECM25C), p. 83
Printer
Serial Distance Extender (PI323A-R2 or PI324A-R2)
RS-232 Cable (ECM25C), p. 83

- **Great for relocating noisy printers.**
- **Now with data rates from 9600 bps to *115.2 Kbps.***

Use a pair of these Extenders and you can set up a printer so far away you won't be able to see it—or hear it. Run parallel to parallel, serial to serial, or cross over from parallel to serial and serial to parallel, using any combination of the individual components listed **at right**.

SPECIFICATIONS

Data Format — Serial: 7 or 8 data bits, even or odd parity; Parallel: 8 data bits
Flow Control — RS-232: X-ON/X-OFF; Parallel: Hardware
CE Approval — PI323-R2–PI325-R2; 230-VAC versions: PI320AE-R3–PI322AE-R3, PI326AE–PI327AE
Interface — Centronics or PC Parallel
Connectors — DB25F
Power — 115 VAC, 60 Hz, 3 watts wallmount (230-VAC version on request)
Size — 1"H x 2.3"W x 3.7"D (2.5 x 5.8 x 9.4 cm)
Weight — 1.4 lb. (0.6 kg) including power supply

FAXBACK INFORMATION
Request Document Number: 10717
Call 412-746-5500 Anytime

Item	Code	Price
Parallel/Serial Sets (Include 1 Input and 1 Output Unit)		
PC Parallel Extender II for Parallel↔Parallel	PI320A-R3	**$235.00**
Serial Distance Extender for Serial↔Serial	PI325A-R2	**$235.00**
Parallel Universal I/O	PI326A	**$199.00**
Serial Universal I/O	PI327A	**$199.00**
Components for Mixed Configurations (Order 1 Input and 1 Output)		
Parallel Input	PI321A-R3	**$133.00**
Output	PI322A-R3	**$133.00**
Serial Input	PI323A-R2	**$133.00**
Output	PI324A-R2	**$133.00**

* * *

PC Drivers (PCD-C, PCD-P)

Send Text to Printers over 3 Miles Away!

- **Interface-powered—use them anywhere.**
- **Install in minutes.**

Transmit text files from your PC's parallel port to a printer located up to 3.1 miles (5 km) away with a pair of these PC Drivers. A PCD-C unit converts your computer's parallel output into a serial data stream running at 19.2 Kbps. Attach it via a 4-wire unconditioned line to a remote PCD-P unit connected to your printer. The PCD-P converts the serial data back to parallel.

SPECIFICATIONS

Connectors — Both models: (1) 5-screw terminal; PI802A: DB25 male; PI803A: 36-pin Centronics
Power — None required
Size — PI802A: 3.5"H x 2.2"W x 1.2"D (9 x 5.5 x 3 cm); PI803A: 5.3"H x 2"W x 1.2"D (13.5 x 5 x 3 cm)
Weight — 0.3 lb. (0.1 kg)

NOTE: The PC Drivers work in sets. Install one PCD-C for each PC, one PCD-P for each printer.

Item	Code	Price
PC Drivers		
for Computer (PCD-C)	PI802A	**$165.00**
for Printer (PCD-P)	PI803A	**$165.00**

* * *

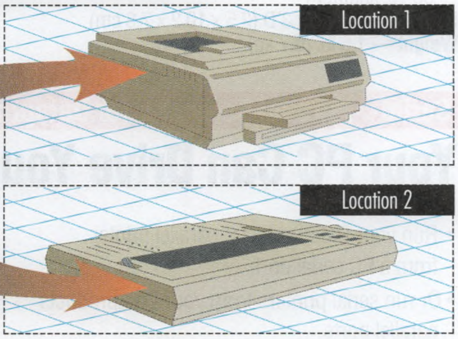
Parallel Data Broadcast/Fallback Unit

Send Data to Two Places at Once!

- **Splits the data stream from one workstation.**
- **Works in Broadcast *or* Fallback Mode. Great for backup.**

Broadcast data in parallel mode to two printers in separate locations simultaneously.

BLACK BOX®
PARALLEL DATA BROADCAST/FALLBACK UNIT
RESET
MODE SWITCH
BC
FB
MODE
PORT
A
B
BUSY
POWER



Here's the perfect solution for sending the same data to two printers at once. In Broadcast Mode, the BLACK BOX® Parallel Data Broadcast/ Fallback Unit gives you two simultaneous copies of the same printout. For example, one for the front office, one for the loading dock. Great for point-of-sale sites, too. Add a pair of SHM-B Parallel Line Drivers (**page 377**) and send data really far—up to 5 miles (8 km) away.

The Unit automatically adjusts its output to match the speed of the slower printer so you can attach different types of parallel printers.

Another option is to set the unit for Fallback Mode to ensure constant access to a printer in mission-critical applications. When the primary printer runs out of paper or goes offline, this unit automatically switches to your designated backup printer.

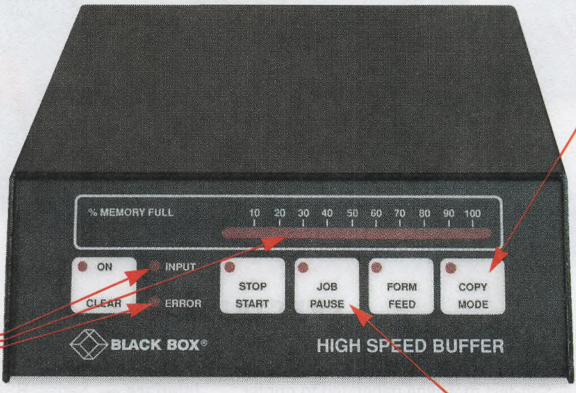
FAXBACK INFORMATION
Request Document Number: 11024
Call 412-746-5500 Anytime

Item	Code	Price
Parallel Data Broadcast/Fallback Unit	PI070A	**$305.00**
remember to order cables		
Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**
For other lengths and genders, see p. 106.		
Extended Distance/Data Cable, 10-ft. (3.0-m) 25 Conductors	EMN25C-0010	**$49.95**
For other lengths, see p. 84. Specify gender when ordering.		

High-Speed Buffers

Buffer Data up to 12,500 cps—from Serial *and* Parallel Input Ports.

- **Switch-selectable to receive data from serial and parallel input ports.**
- **All versions upgradable to 4 MB.**
- **Speeds up to 115.2 Kbps.**



Make up to 255 copies without resending print job.

Status indicators—no need to use complicated network software.

Enables you to change paper or ink as needed.

This Buffer clears your PC screen before you can walk to the coffeemaker and pour yourself another cup. It receives data from both a serial and a parallel input port. Its output port can be serial or parallel—it's switch-selectable.

FAXBACK INFORMATION
Request Document Number: 10030
Call 412-746-5500 Anytime

SPECIFICATIONS

Flow Control — DTR; X-ON/X-OFF
Speed — Switch-selectable; Input: 9600 bps, 19.2, 38.4, 115.2 Kbps; Output: 300, 1200, 2400, 4800, and 9600 bps, 19.2, 38.4, 115.2 Kbps
Interface — Input: Serial: RS-232, DTE; Parallel: Centronics compatible;
Output (switch-selectable): Serial: RS-232, DTE; Parallel: DB25 female, IBM type, Centronics compatible
Connectors — (2) Input ports: Serial: DB25 female; Parallel: 36-pin Centronics female; Output: Serial: DB25 male; Parallel: DB25 female
Power — Power adapter, 9 VDC @ 300 mA, UL® and CSA approved
Size — 2"H x 6.1"W x 9.3"D (5.1 x 15.5 x 23.6 cm)
Weight — 2 lb. (0.9 kg)

Item	Code	Price
High-Speed Buffers		
1-MB	PI016A	**$715.00**
2-MB	PI017A	**$815.00**
3-MB	PI018A	**$970.00**
4-MB	PI019A	**$1125.00**
To boost your buffer's memory, order our...		
SIMM Upgrade		
256K	PI022	**$52.00**
1-MB	PI023	**$154.00**
Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**
For other lengths and genders, see p. 106.		
Extended Distance/Data Cable, 10-ft. (3.0-m) 25 Conductors	EMN25C-0010	**$49.95**
For other lengths, see p. 84. Specify gender when ordering.		

remember to order **cables**

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Parallel Buffers

Now You Can Send Your Laptop's Data to Your Parallel Printer.

- **Works with any parallel printer.**
- **Choose either a 128- or 512-KB buffer.**
- **17,000 cps moves any job through—*fast!***

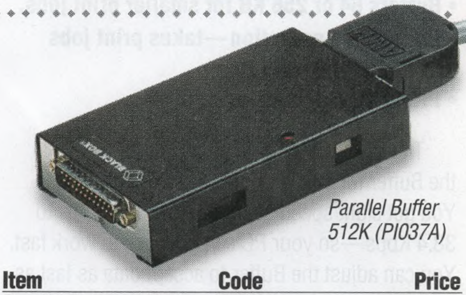
The BLACK BOX® Parallel Buffer is one of the fastest printer buffers on the market today. The big plus—it's also compact enough to carry along with your laptop computer when you travel.

You can put your printer up to 40 feet (20 feet of cable on each side of the buffer) from your computer.

SPECIFICATIONS

Flow Control — Hardware handshaking
Memory — 128- or 512-KB RAM
Connectors — (1) DB25 male (input), (1) DB25 female (output)
Power — 9 VDC @ 0.5 A from 115-VAC, 60-Hz wallmount power supply; PI037A available with 230-VAC, 50-Hz power supply on request
Size — 1"H x 4"W x 3"D (2.5 x 10.2 x 7.6 cm)
Weight — 1.5 lb. (0.7 kg)

FAXBACK INFORMATION
Request Document Number: 15042
Call 412-746-5500 Anytime



Parallel Buffer 512K (PI037A)

Item		Code	Price
Parallel Buffer	128K	PI036A	**$135.00**
	512K	PI037A	**$199.00**
Parallel Printer Cable, 10-ft. (3.0-m) Male/Male		EYN600-0010-MM	**$16.95**
For other lengths and genders, see p. 106.			
RS-530 Data Cable, 10-ft. (3.0-m) Male/Male		EVN530-0010-MM	**$41.95**
For other lengths or genders, see p. 88.			

remember to order **cables**

Black Box Explains...

Buffers.

A buffer (also called a spooler or a cache) is a temporary-storage device used to share printers and compensate for a difference in data rate and data flow between two devices. Buffers use RAM (Random-Access Memory) to take in data and hold it until the receiving device handles it.

A buffer serving a computer can be installed either internally or externally. While internal computer buffers are common in the forms of keyboard inputs, data caches, and video memory, an external buffer is usually used for printing.

An external buffer downloads jobs to the printer, freeing the computer to be productive while the job is being printed, so you can get back to work sooner.

A print buffer's ports can be serial, parallel, or serial *and* parallel. Because a buffer's ports operate independently of each other, a buffer can be made to also perform serial-to-parallel or parallel-to-serial conversion or to change the word structure and/or serial data rate (baud rate) of the data.

While most buffers are FIFO (First In, First Out), some advanced units can function as random-access buffers.

For most serial buffers, hardware flow control is required, but some also support software (X-ON/X-OFF) control.

Most buffers support printing of multiple copies of a document, provided the entire print job will fit in the buffer.

MiniBuffer • Micro-MiniBuffer

Serial to Parallel or Parallel to Serial—These Buffers Do Both.

It's easy to get serial and parallel devices to work together. Just select the model that best suits your needs.

MiniBuffer

- **Buffers up to 2 MB for large print jobs.**
- **High-speed operation—takes print jobs at up to 38.4 Kbps.**
- **Prints up to 999 copies of a file.**

Increase the productivity of your desktop publishing system. The BLACK BOX® MiniBuffer has up to 2 MB of memory to buffer large print files. Output large files quickly and get back to work.

Micro-MiniBuffer

- **Buffers 64 or 256 KB for smaller print jobs.**
- **High-speed operation—takes print jobs at up to 38.4 Kbps.**
- **Prints up to 99 copies of a file.**

The BLACK BOX® Micro-MiniBuffer is the Buffer for smaller print jobs and budgets. You get eight speed settings—from 300 bps to 38.4 Kbps—so your PC can get back to work fast. You can adjust the Buffer to accept data as fast as your PC can send it. You can also pause printing at any time to adjust the paper or check print quality.

BLACK BOX®
MICRO-MINIBUFFER
Reset
Copy/Pause
MINIBUFFER
BLACK BOX®
STATUS
COPY/PAUSE
RESET

EXCLUSIVE

Top: PI332A;
Bottom: PI452A

SPECIFICATIONS

Data Format — 7 data bits, even or odd parity; 8 data bits, no parity
Diagnostics — Self-test message generated to printer
Flow Control — Serial: Hardware or X-ON/X-OFF; Parallel: Hardware (Busy/ACK)
Memory — MiniBuffer: 256-KB, 512-KB, 1-MB, and 2-MB models; Micro-MiniBuffer: 64-KB or 256-KB models
Speed — 300 bps to 38.4 Kbps (each serial port independently selectable)
CE Approval — 230-VAC versions: PI331AE–PI334AE, PI341AE–PI344AE, PI431AE–PI434AE, PI441AE–PI444AE, PI451AE–PI454AE, PI461AE–PI464AE
Interface — Serial: RS-232 async ASCII (input port is DTE, output port is DCE); Parallel: Centronics® and IBM® PC parallel compatible
Size — MiniBuffer: 2.2"H x 5.6"W x 8.5"D (5.6 x 14.2 x 21.6 cm); Micro-MiniBuffer: 2.4"H x 8.1"W x 6.3"D (6.1 x 20.6 x 16 cm)
Weight — MiniBuffer: 3 lb. (1.4 kg.); Micro-MiniBuffer: 2.5 lb. (1.1 kg)

Item		Code	Price
MiniBuffer			
Serial/Serial	256K	PI431A	**$510.00**
	512K	PI441A	**$590.00**
	1MB	PI451A	**$715.00**
	2MB	PI461A	**$795.00**
Serial/Parallel	256K	PI432A	**$510.00**
	512K	PI442A	**$590.00**
	1MB	PI452A	**$715.00**
	2MB	PI462A	**$795.00**
Parallel/Parallel	256K	PI433A	**$510.00**
	512K	PI443A	**$590.00**
	1MB	PI453A	**$715.00**
	2MB	PI463A	**$795.00**
Parallel/Serial	256K	PI434A	**$510.00**
	512K	PI444A	**$590.00**
	1MB	PI454A	**$715.00**
	2MB	PI464A	**$795.00**

Item		Code	Price
Micro-MiniBuffer			
Serial/Serial	64K	PI331A	**$205.00**
	256K	PI341A	**$280.00**
Serial/Parallel	64K	PI332A	**$205.00**
	256K	PI342A	**$280.00**
Parallel/Parallel	64K	PI333A	**$205.00**
	256K	PI343A	**$280.00**
Parallel/Serial	64K	PI334A	**$205.00**
	256K	PI344A	**$280.00**

remember to order **cables**

For Serial Input...
AT® Serial Cable, 10-ft. (3.0-m)
EVMBPC-0010 **$11.95**
For other lengths, see page 108.

For Serial Output or Parallel Input...
RS-232 Cable, 25-Conductor, 10-ft. (3.0-m)
Male/Male ECM25C-0010-MM **$23.95**
For other lengths and genders, see page 83.

For Parallel Output...
Parallel Printer Cable, 10-ft. (3.0-m)
Male/Male EYN600-0010-MM **$16.95**
For other lengths and genders, see page 106.

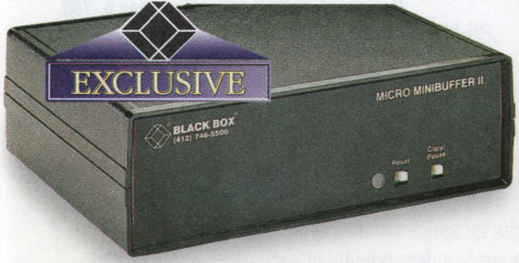
Micro-MiniBuffer II

Power Printing: More Memory and More Speed with Our Fastest Buffer Yet!

- **Buffers up to 1 MB for large print jobs.**
- **High-speed printing—up to 115.2 Kbps.**
- **Prints up to 99 copies of a file.**
- **Supports strobe lengths of newer printers.**

Our new Micro-MiniBuffer II is so fast, your print jobs will be sent before you can nod off—so you can get back to work quickly! Configure the Micro-MiniBuffer II to accept data as fast as your PC can send it—from 300 bps to 115.2 Kbps.

Your data spools rapidly to the Buffer's memory. Then it's fed out at a rate your printer can handle. Choose the 256-K model for smaller jobs or the 1-MB model for *power printing*!



EXCLUSIVE

SPECIFICATIONS

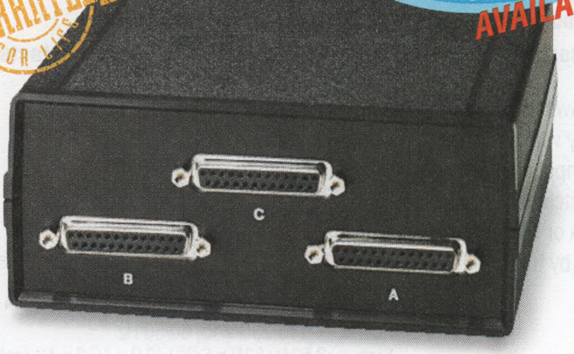
Data Format — 7 data bits, even or odd parity; 8 data bits, no parity
Flow Control — Serial: Hardware or X-ON/X-OFF; Parallel: Hardware (Busy/ACK)
Speed — Serial: Up to 115.2 Kbps; Parallel: 10,000 cps
CE Approval — 230-VAC versions: PI360AE–PI363AE, PI370AE–PI373AE
Interface — Serial: RS-232 async ASCII (input port is DTE, output port is DCE); Parallel: Centronics® and IBM® PC compatible
Connector — (2) DB25 female
Power — 115 VAC, 60 Hz, 20 watts
Size — 2.4"H x 8.1"W x 6.3"D (6.1 x 20.6 x 16 cm)

FAXBACK INFORMATION
Request Document Number: 14254
Call 412-746-5500 Anytime

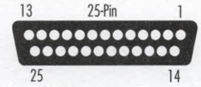
Item		Code	Price
Micro-MiniBuffer II			
256K	Serial/Serial	PI360A	**$288.00**
	Serial/Parallel	PI361A	**$288.00**
	Parallel/Parallel	PI362A	**$288.00**
	Parallel/Serial	PI363A	**$288.00**
1 MB	Serial/Serial	PI370A	**$389.00**
	Serial/Parallel	PI371A	**$389.00**
	Parallel/Parallel	PI372A	**$389.00**
	Parallel/Serial	PI373A	**$389.00**

Lifetime DB25 Switches

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!



FAXBACK INFO
Request Document Number: 10140
Call 412-746-5500
Anytime



DB25 female

- Tested to 25,000 use-cycles to ensure reliability.
- Share printers, modems, or other peripherals.
- Available for special applications.

Item	Chassis Style	Code	Price
ABC-25 (2 to 1) Switches	**A**		
25 Leads, Serial or Parallel (for PC users)		SWL025A	**$49.95**
12 Leads		SWL088A	**$45.00**
4 Leads		SW084A	**$74.00**
ABC-25 (2 to 1) Switch Ready Paks			
25-Lead Switch Ready Pak Includes: the Switch, **plus** (**2**) RS-232 Cables **and** (**1**) Parallel Printer Cable		SWL025A-FFF-CABPAK	**$111.80**
12-Lead Switch Ready Pak Includes: the Switch, **plus** (**2**) AT Serial Printer Cables **and** (**1**) RS-232 Cable		SWL088A-FFF-CABPAK	**$92.85**
ABC-25 EMI/RFI			
25 Leads	**A**	SWL023A	**$59.95**
ABC-25 Monitor Switch			
24 Leads	**A**	SW015A	**$112.00**
ABC-25 Lock-Up Switch, 24 Leads, Pin 1 Tied Common, Key-Operated	**B**	SW020A	**$142.00**
ABCDE (4 to 1) Switches	**B**		
25 Leads, Serial or Parallel (for PC Users)		SWL026A	**$79.00**
12 Leads		SWL058A	**$69.95**
4 Leads		SW054A	**$117.00**
ABCDE (4 to 1) Switch Ready Paks			
25-Lead Switch Ready Pak Includes: the Switch, **plus** (**4**) RS-232 Cables **and** (**1**) Parallel Printer Cable		SWL026A-FFFFF-CABPAK	**$188.75**
ABCDE-25 EMI/RFI, 25 Leads	**B**	SWL024A	**$79.00**
ABCDE-25 Monitor Switch			
24 Leads	**B**	SW055A	**$170.00**
X-Switch (2 to 2)	**A**		
25 Leads, Serial or Parallel (for PC Users)		SWL027A	**$75.00**
12 Leads		SW100A	**$127.00**
DB25 6 to 1 Switch			
Parallel 12 Leads	**A**	SW059A	**$200.00**
Serial 25 Leads	**A**	SWL090A	**$89.95**
RS-232 Cable, 10-ft. (3.0-m)		ECM25C-0010	**$23.95**

remember to order cables

For other lengths, see p. 83. Specify gender when ordering.

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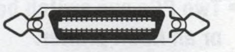
Lifetime Switches for Centronics

- Ideal for parallel-printer sharing.
- Use the cables you already have.



36-pin Centronics® female

Item	Leads	Chassis Style	Code	Price
ABC Switch (2 to 1)	36	**B**	SW250A	**$55.00**
ABCDE Switch (4 to 1)	24	**B**	SW260A	**$89.00**
X Switch (2 to 2)	24	**B**	SW270A	**$145.00**
Centronics® Extension Cable, 10-ft. (3.0-m)			EQN380-0010	**$35.55**

remember to order cables

For other lengths, see p. 105. Specify gender when ordering.

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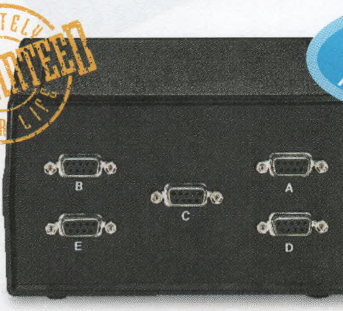
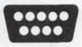
CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!





DB9 female

DB9 Switches

Item	Chassis Style	Code	Price
ABC Switches (2 to 1)	**A**	SWL030A	**$45.00**
Lock-Up	**B**	SW034A	**$133.00**
ABC DB9 Switch Ready Pak Includes: the 2-to-1 Switch **plus** (**3**) 10-ft. DB9 Cables		SWL030A-FFF-CABPAK	**$113.85**
ABCDE Switch (4 to 1)	**B**	SWL031A	**$69.95**
X-Switch (2 to 2)	**A**	SW033A	**$118.00**
6 to 1 Switch	**B**	SW035A	**$143.00**
DB9 Extension Cable, 10-ft. (3.0-m)		EDN12H-0010-MM	**$22.95**

remember to order cables

For other lengths and genders, see p. 105.

MORE! Manual Switches, see pp. 242–249.

Black Box Explains...

Basic Printer Switches.

Mechanical—A mechanical switch is operated by a knob or by pushbuttons and uses a set of copper or gold-plated copper contacts to make a connection. The internal resistance created by this type of connection will affect your signal's transmission distance and must be taken into account when calculating cable lengths.

Electronic—Although electronic switches are controlled by knobs and pushbuttons like mechanical switches, the switching is accomplished with electronic gates, not mechanical contacts. Electronic switches don't have the internal resistance of a mechanical switch—some even have the ability to drive signals for longer distances. And since they don't generate electronic spikes like mechanical switches, they're safe for sensitive components such as HP® laser printers. Some electronic switches can be operated remotely.

Local/Remote Electronic Switch

BLACK BOX®
(412) 746-5500
2 TO 1
LOCAL / REMOTE
SWITCH
A
B
REMOTE
PWR
A
B
SERIAL
PARALLEL
REMOTE
C

The Simple, *Inexpensive* Alternative to a Code-Operated Switch.

- **Electronic switching for all your needs—and it's safe for your LaserJet® printer.**
- **Choose your remote access port: RS-232, RS-422, RS-485, RS-530, TTL, or dry contacts.**

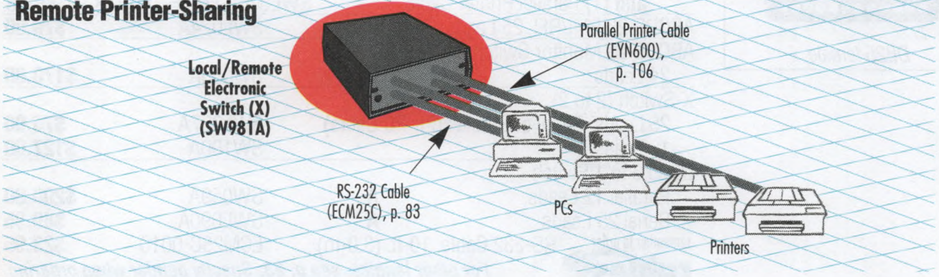
The Local/Remote Electronic Switch works electronically, locally, and remotely with a number of interfaces and a wide range of input voltages.

It's smarter than a manual switch because it can switch remotely through EIA or TTL control signals. Or, you can switch locally by turning the knob.

SPECIFICATIONS

Leads Supported — DB25: 1–25
Signal Level — 15 volts maximum
CE Approval — All items listed are approved
Interface — RS-232, TTL, Centronics®, RS-530, V.35, analog, and more
Connectors — (3), (4), or (5) DB25 female on rear panel; (1) RJ-45, (1) 4-screw terminal
Indicators — (1) Switch position
Power — 115/230 VAC, 60/50 Hz
Size — 3.5"H x 6"W x 6.3"D (8.9 x 15.2 x 16 cm)
Weight — 2 lb. (0.9 kg)

Remote Printer-Sharing


Local/Remote Electronic Switch (X) (SW981A)
Parallel Printer Cable (EYN600), p. 106
RS-232 Cable (ECM25C), p. 83
PCs
Printers

Item	Code	Price
Local/Remote Electronic Switch		
ABC (2 to 1)	SW980A	**$200.00**
ABCDE (4 to 1)	SW982A	**$235.00**
X (2 to 2)	SW981A	**$260.00**
remember to order **cables** RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83. Specify gender when ordering.		
RJ-45 (8-Wire) Modular Cable, 7-ft. (2.1-m) Straight-Pinned	EL08MS-07	**$4.95**
For other lengths and pinnings, see p. 71.		

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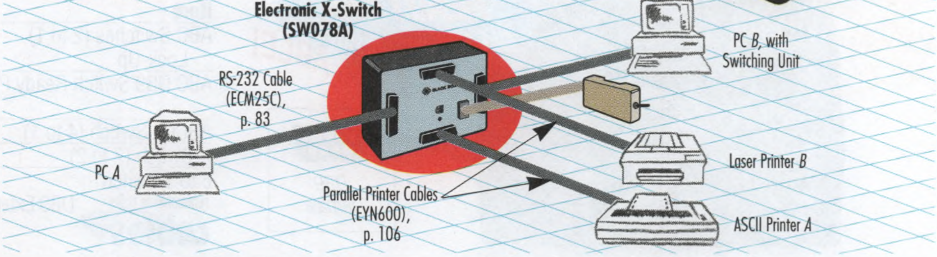
Electronic X-Switch

Electronic Switching between Your ASCII Printer and a Laser Printer.

- **Two PCs can switch between a laser printer or an ASCII printer.**
- **Electronic switching keeps laser printers safe!**

Two modes are available: straight-through or crossover. Straight-through Mode connects PC *A* to Printer *A* and PC *B* to Printer *B*. Crossover position joins PC *A* to Printer *B* and PC *B* to Printer *A*.

X-SWITCH – SERIAL
MADE IN U.S.A.
PRINTER A
BLACK BOX®
ELECTRONIC X-SWITCH (SERIAL)
COMPUTER A
COMPUTER B
POWER 9 VAC
POWER
PRINTER B
REMOTE SWITCH


Electronic X-Switch (SW078A)
RS-232 Cable (ECM25C), p. 83
PC *A*
PC *B*, with Switching Unit
Laser Printer *B*
ASCII Printer *A*
Parallel Printer Cables (EYN600), p. 106

Can't Find the Printer Switch You Need?

See our Switch Section on **pages 240–293** for the greatest selection of switches in the industry.

If you still can't find what you need, call Technical Support at **412-746-5500** and talk to one of our experts. They're available—FREE!—24 hours a day, 7 days a week. Our Tech Support Team can even help you customize a switch for your specific requirements.

FAXBACK INFORMATION
Request Document Number: 11165
Call 412-746-5500 Anytime

SPECIFICATIONS

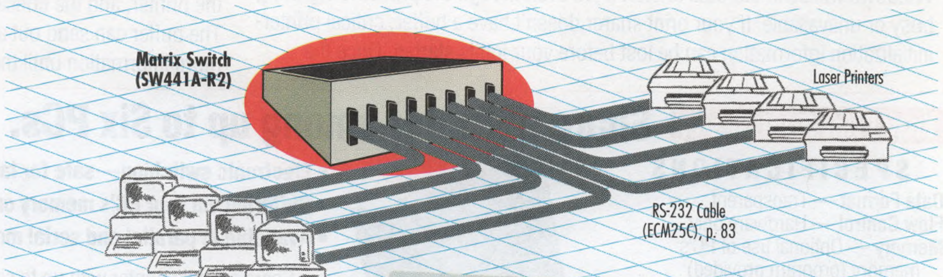
Flow Control — Hardware handshaking
Leads Supported — Serial: 2–6, 8, 20, 22 switched, 1 and 7 tied common
Remote Switch — 2-Position toggle switch with 7-ft. (2.1-m) RJ-11 power cord
CE Approval — 230-VAC version: SW079AE
Interface — Parallel: IBM parallel; Serial: RS-232
Connectors — Parallel: (4) DB25 female; Serial: (2) DB25 female, (2) DB25 male
Indicators — (1) Power on each model
Power — 9 VAC @ 300 mA
Size — 4"H x 6"W x 2"D (10.2 x 15.2 x 5.1 cm)
Weight — 1.2 lb. (0.5 kg)

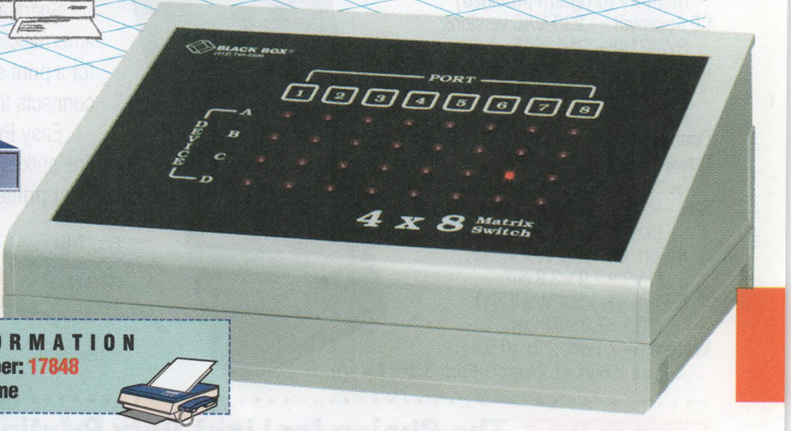
Item	Code	Price
Electronic X-Switch		
Parallel	SW078A	**$200.00**
Serial	SW079A	**$200.00**
remember to order **cables** RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83. Specify gender when ordering.		
RJ-45 (8-Wire) Modular Cable, 7-ft. (2.1-m) Straight-Pinned	EL08MS-07	**$4.95**
For other lengths and pinnings, see p. 71.		
Laser Printer Cable, 10-ft. (3.0-m) Male/Male	BC00202	**$11.95**
For other lengths, see p. 106.		

Matrix Switches (4 x 4 and 4 x 8)

Even Easier to Switch than Before! Share Four Printers among up to Eight Users.

- **New faceplate makes switching and viewing connected devices easier.**
- **Replace four smaller switches with one Matrix Switch and save money.**
- **Compatible with microcomputers and serial or parallel printers.**
- **Fast switching between printers.**
- **Bidirectional parallel IEEE Standard 1284-1994 compliant.**





EXCLUSIVE

If your office is like most, you probably have a variety of things going on at once. Everyone's working on PCs, and everyone has to route whatever they're working on to a printer by the end of the day. The traffic jam can be, in a word, a nightmare.

With the Matrix Switch from Black Box, up to eight users can share any combination of up to four laser printers, plotters, or high-speed modems. Serial models are bidirectional, so four users can also share a generous network of up to eight peripherals. And because one Matrix Switch can replace as many as four smaller manual or electronic switches, you save money!

Now, the Matrix Switch is even easier to use. A grid on the front panel indicates all possible input-to-output port connections. Simply choose any input to any output by pressing one button. A red indicator in the button tells you when the selection is made.

While the Matrix Switch is ideal for all-PC offices, you can also use it with more than just PCs and printers. Matrix Switches can connect any serial or parallel device. For instance, a cluster of minicomputers can share peripherals. You can connect any input to any output by pressing one button.

FAXBACK INFORMATION
Request Document Number: 17848
Call 412-746-5500 Anytime

SPECIFICATIONS

Leads Supported — Serial: 2–6, 8, 15, 17, 19–20, 22, and 24, with Pin 7 common; Parallel: All 25 pins

Speed — Up to 5 Mbps

CE Approval — 230-VAC versions: SW441AE-R2–SW444AE-R2

Interface — Serial: RS-232; Parallel: IBM® PC compatible parallel; IEEE Standard 1284-1994 compliant supporting Compatibility and Nibble modes

Connectors — Serial: Input: DB25S female, Output: DB25S male; Parallel: Input: DB25S male, Output: DB25S female

Power — 115 VAC, 60 Hz, 6 watts

Size — SW441A-R2–SW442A-R2: 3.5"H x 9"W x 7.5"D (8.9 x 23 x 19.1 cm); SW443A-R2–SW444A-R2: 3.5"H x 13"W x 7.5"D (8.9 x 33 x 19.1 cm)

Weight — SW441A-R2–SW442A-R2: 3.9 lb. (1.8 kg); SW443A-R2–SW444A-R2: 4.8 lb. (2.2 kg)

Item	Code	Price
Matrix Switch (4 Users x 4 Peripherals)		
Serial	SW441A-R2	**$499.00**
Parallel	SW442A-R2	**$499.00**
Matrix Switch (4 Users x 8 Peripherals)		
Serial	SW444A-R2	**$745.00**
Parallel	SW443A-R2	**$745.00**
remember to order **cables** RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83. Specify gender when ordering.

Black Box Explains...

Advanced Printer Switches.

Matrix—A Matrix Switch is an Electronic Switch with a keypad for selecting one of many input ports to connect to any one of many output ports.

Port-Contention—A Port-Contention Switch is an automatic Electronic Switch that can be serial *or* parallel but not both. It has multiple input ports but only one output port. The Switch monitors all ports simultaneously. When a port sends data, it prints while all the other ports have to wait.

Scanning—A Scanning Switch is like a Port-Contention Switch but scans ports one at a time to find one that's sending data.

Code-Operated—Code-Operated Switches send a code (data string) from a PC or terminal to select a port.

Matrix Code-Operated—This Matrix version of the Code-Operated Switch can be an any-port to any-port switch. This means than any port on the Switch can attach to any other port or any two or more ports can make a simultaneous link and transfer data.

Black Box Explains...

Printer Sharing with Windows.

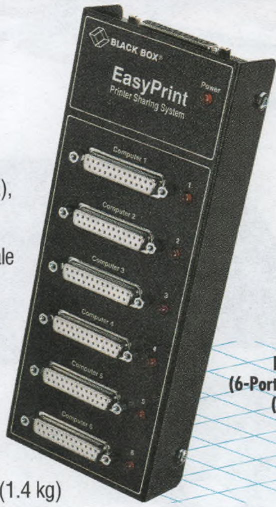
Unlike the earlier DOS operating systems, Windows® doesn't check to see if the printer is busy at the very beginning of the printing process. Windows will send out data to start a job even though the printer is signaling busy or unavailable. If your print sharer doesn't have a buffer, critical printer-initialization information can be lost before your job is started. Once the initialization information is lost, the printer cannot interpret the job correctly.

A buffered print-sharing device is the most practical solution. When Windows starts printing to a buffered port, it "thinks" it's talking directly to the printer, and the critical initialization information is stored by the buffer. The buffer can send out a busy signal to Windows so that it delays sending more information until the buffer is accessible again.

Easy Print Print-Sharer Share a Printer among up to Six PCs.

SPECIFICATIONS

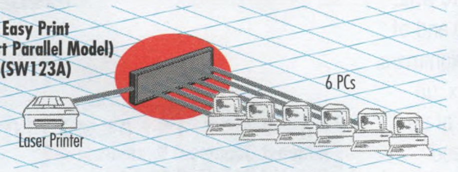
Data Format — Transparent
Flow Control — Hardware only
Memory — Optional use of PC's memory (program provided)
CE Approval — 230-VAC versions: SW121AE–SW126AE
Interface — RS-232 async ASCII (DCE), Centronics® or IBM® PC parallel compatible
Connectors — (3), (5), or (7) DB25 female
Power — 115 VAC, 60 Hz; Serial: 10 watts; Parallel: 6 watts
Size — 2-Port: 2.2"H x 5.3"W x 1.3"D (5.6 x 13.5 x 3.3 cm); 4-Port: 6"H x 3.1"W x 1.5"D (15.2 x 7.9 x 3.8 cm); 6-Port: 8"H x 3.1"W x 1.5"D (20.3 x 7.9 x 3.8 cm)
Weight — 2-Port: 2 lb. (0.9 kg); 4-Port: 2.6 lb. (1.2 kg); 6-Port: 3 lb. (1.4 kg)



- **Electronic switching—safe for laser printers.**
- **Buffering via your PC's memory or hard drive.**
- **Available in parallel and serial models.**

Share a single printer with up to six PCs—automatically. Easy Print scans PC ports looking for a print signal. When it finds one, it simply connects that computer and prints the file.

Easy Print is all electronic—it doesn't cause line spikes that can fry the circuits of an HP® laser printer. Software is included.



FAXBACK INFO
Request Document Number: 14955
Call 412-746-5500
Anytime

Item	Code	Price
Easy Print		
Parallel		
2-Port	SW121A	**$139.00**
4-Port	SW122A	**$219.00**
6-Port	SW123A	**$249.00**
Serial		
2-Port	SW126A	**$139.00**
4-Port	SW124A	**$219.00**
6-Port	SW125A	**$249.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**

Specify gender when ordering
For other lengths, see p. 83.

For other lengths and genders, see p. 106.

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Print Switch II The Choice for Light-Duty Printing!

- **Electronic switching safe for HP laser printers.**
- **Mounts on your PC or printer with Velcro®.**
- **Supports Windows.**

The Print Switch II supports Windows and is great for light-duty situations that don't require simultaneous printing. One PC can use two printers—just use a software code to select a printer. And with our parallel model, two PCs can share one printer. Each user gets automatic access as needed.

EXCLUSIVE

BLACK BOX
PRINTSWITCH II
(PARALLEL)
BUSY
SELECT

SPECIFICATIONS

Maximum Distance — Serial: 50 ft. (15 m) over EIA cable; Parallel: 20 ft. (6 m) to input, 20 ft. (6 m) from output
Speed — Serial: 600 bps to 115.2 Kbps; Parallel: 10,000 cps
CE Approval — 230-VAC versions: SW285AE–SW286AE
Interface — Serial or parallel; RS-232 ASCII
Connectors — (3) DB25 female
Power — 115-VAC, 60-Hz wallmount transformer
Size — 1"H x 3.2"W x 5.8"D (2.5 x 8.1 x 14.7 cm)
Weight — 0.2 lb. (0.1 kg)

FAXBACK INFORMATION
Request Document Number: 14357
Call 412-746-5500 Anytime

Item	Code	Price
Print Switch II		
Serial	SW285A	**$159.00**
Parallel	SW286A	**$139.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**

For other lengths, see p. 83.

For other lengths and genders, see p. 106.

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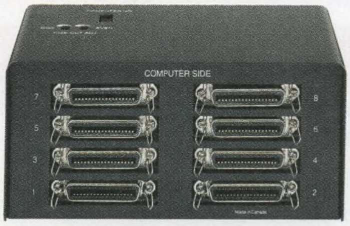
Auto Parallel Switch Share Your Parallel Printer with up to Eight PCs.



If your print jobs vary in size and you have an office of up to eight people, consider our Auto Parallel Switch. It's easy to connect using standard parallel printer cables. And with its 8-KB buffer, it's the economical answer to handling smaller print jobs.

SPECIFICATIONS

Interface — Centronics and IBM PC parallel compatible
Connectors — Input: (2), (4), or (8) 36-pin Centronics female; Output: (1) DB25 female
Indicators — 7-segment display for Power-up, Ready, and Port Activity Status;
Power — 115 VAC, with plug-in adapter
Size — 2-Port: 2.2"H x 8.7"W x 4.3"D (5.6 x 22.1 x 10.9 cm); 4-Port: 3"H x 8.7"W x 4.3"D (7.6 x 22.1 x 10.9 cm); 8-Port: 4.5"H x 8.7"W x 4.3"D (11.4 x 22.1 x 10.9 cm)
Weight — 2-Port: 4.2 lb. (1.9 kg); 4-Port: 4.8 lb. (2.2 kg); 8-Port: 6.2 lb. (2.8 kg)

FAXBACK INFORMATION
Request Document Number: 10944
Call 412-746-5500 Anytime

Item	Code	Price
Auto Parallel Switch		
2-Port	SW803A	**$295.00**
4-Port	SW805A	**$395.00**
8-Port	SW809A	**$595.00**
remember to order cables Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**

For other lengths and genders, see p. 106.

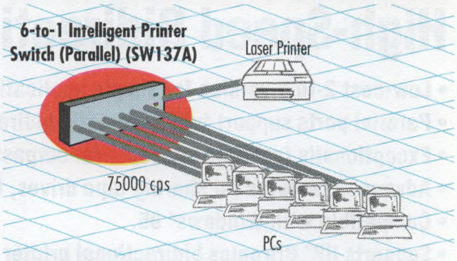
Intelligent Printer Switch (Parallel)

Fast, Easy Print-Sharing with the Intelligent Printer Switch.

- **Compatible with all popular software—including graphics and Windows programs.**
- **High performance—up to 75,000 characters per second.**
- **Can support up to six PCs.**

With today's high-performance software applications like Windows® and graphics-intensive programs, computer users demand more memory, larger hard disks, faster processors, and more powerful laser printers. Now you can improve the printing performance of your PCs and printers by connecting them to a more intelligent switch.

Use the BLACK BOX® Intelligent Printer Switch to maximize your system's potential. Its unique Interface Matching Technology produces a significant advantage over direct connection—and watch what happens to your printing performance!



SPECIFICATIONS

Performance — 75,000 cps
Selectable Options — 8, 16, 60, or 120 seconds; form feed on change of user; self-test/cable test
CE Approval — 230-VAC versions: SW135AE–SW137AE
Connectors — Inputs: 2, 4, or 6 36-pin Centronics®; Output: (1) DB25 female
Power — 115-VAC wallmount transformer supplied
Size — 3.7"H x 9"W x 1.4"D (9.4 x 22.9 x 3.6 cm)
Weight — 1 lb. (0.5 kg)

FAXBACK INFORMATION
Request Document Number: 15839
Call 412-746-5500 Anytime

Item	Code	Price
Intelligent Printer Switch (Parallel)		
2 to 1	SW135A	**$149.00**
4 to 1	SW136A	**$229.00**
6 to 1	SW137A	**$259.00**

remember to order cables

Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**

For other lengths and genders, see p. 106.

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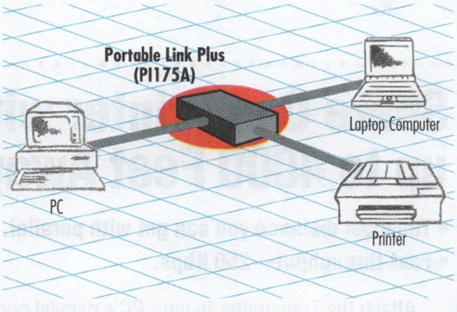
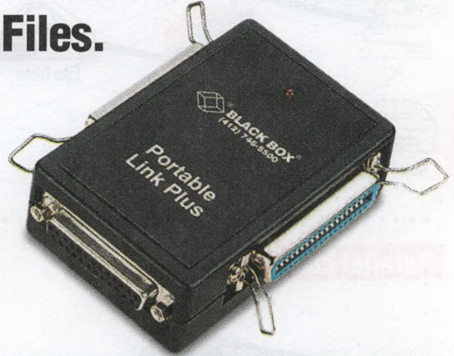
Portable Link Plus

Switch without a Hitch: PC and Laptop Files.

- **Trouble-free network for two PCs and one printer.**
- **Easy-to-use hardware and software—software has built-in Help.**
- **Most economical networking solution.**
- **Microsoft® Windows compatible.**

This is *the* printer interface to have if you transfer large files frequently between laptop and desktop—or if two PCs need to share one printer. No more disk-swapping, no more cable juggling. Plug this unit just once into your PCs' parallel ports for instant connectivity. All you need are Parallel Printer Cables and you can connect your laptop to your PC, or link two PCs with a printer. Make the switch!





SPECIFICATIONS

File-Transfer Rate — 80,000 cps
Printer-Transfer Rate — 50,000 cps
Connectors — (2) Centronics 36-pin female; (1) DB25 female
Power — From the interface
Size — 3.7"H x 3"W x 1.1"D (9.5 x 7.5 x 2.9 cm)
Weight — 0.8 lb. (0.5 kg)

FAXBACK INFORMATION
Request Document Number: 13480
Call 412-746-5500 Anytime

Item	Code	Price
Portable Link Plus	PI175A	**$149.95**

remember to order cables

Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**

For other lengths and genders, see p. 106.

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Expandable Print Sharers

Mix Your Serial and Parallel PCs and Printers.

- Nonbuffered and Buffered Base Units available in serial *or* parallel.
- Parallel or serial computers can print to parallel or serial printers with buffered units.

To Parallel Workstations
To Serial Workstations

Buffered Expandable Print Sharer, Parallel (PI224A)

4-Port Expansion, Serial (PI221A)

Item		Code	Price
Nonbuffered Expandable Print Sharers			
Parallel Base Unit		PI210A	**$310.00**
4-Port Parallel Expansion		PI211A	**$270.00**
4-Port Serial Expansion (for Parallel Base Unit only)		PI212A	**$270.00**
Serial Base Unit		PI213A	**$335.00**
4-Port Serial Expansion (for Serial Base Unit only)		PI221A	**$230.00**
Buffered Expandable Print Sharer			
Parallel Base Unit	512 KB	PI224A	**$690.00**
	256 KB	PI223A	**$560.00**
Serial Base Unit	512 KB	PI225A	**$670.00**
	256 KB	PI220A	**$525.00**
4-Port Parallel Expansion (for Parallel and Serial Models)		PI222A	**$230.00**
4-Port Serial Expansion (for Parallel and Serial Models)		PI221A	**$230.00**

remember to order cables

IBM Input Cable 10-ft. (3-m) PC/XT™	EHMPI08-0010	**$21.55**
IBM Input Cable 10-ft. (3-m) AT®	EHMPI09-0010	**$21.55**

Call for other lengths.

Laser Printer Cable, 10-ft. (3.0-m)	BC00202	**$11.95**

For other lengths, see p. 106.

RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.
Specify gender when ordering.

PC Parallel Hypercable, 30-ft. (9.1-m) Male/Male	EQHYP4-0030	**$70.00**

For other lengths, see p. 107.

Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**

For other lengths and genders, see p. 106.

Switches
Sharers
Spoolers

Peripheral Sharers

High-Speed Bidirectional Data Sharing!

EXCLUSIVE
SELECT
STATUS
BLACK BOX
(412) 746-5500
Peripheral Sharer
1
2
3
4

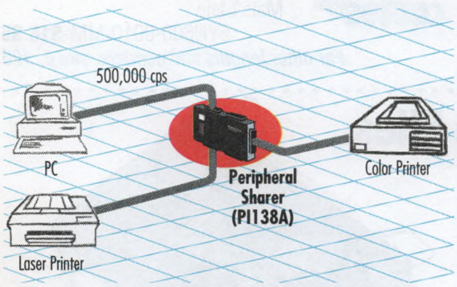
- **Low-cost 2-to-1 version for simple applications.**
- **Parallel ports support fully automatic bidirectional interactive communication.**
- **Exceptionally fast data speeds—far surpassing conventional data switches.**
- **Advanced features for sharing tape drives, CD-ROMs, and many other devices.**
- **Compatible with Windows® 95.**
- **Supports HP® Bitronics bidirectional printer interface.**

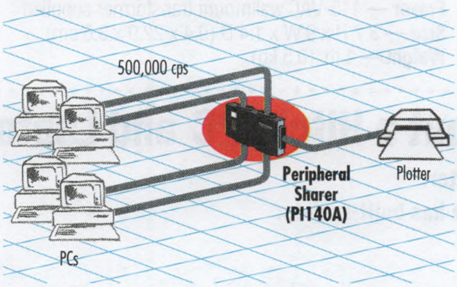
The Peripheral Sharer turns your PC's parallel port into a bidirectional link to a shared peripheral device. It's the ideal solution for sharing a laser printer or plotter among a small local workgroup.

Incoming data zips forward at up to 500,000 cps—and that's fast.

SPECIFICATIONS

CE Approval — 230-VAC versions: PI138AE, PI140AE, PI150AE
Interface — (2), (4) or (6) parallel ports for PCs; (1) or (2) parallel ports for a shared peripheral
Connectors — (5) DB25 female parallel
Power — 115-VAC wallmount adapter (included)
Size — 3.5"H x 5.9"W x 1"D (8.9 x 15 x 2.5 cm)
Weight — 0.8 lb. (0.4 kg)


500,000 cps
PC
Peripheral Sharer (PI138A)
Color Printer
Laser Printer


500,000 cps
PCs
Peripheral Sharer (PI140A)
Plotter

FAXBACK INFORMATION
Request Document Number: 15846
Call 412-746-5500 Anytime

Item	Code	Price
Peripheral Sharer		
2 to 1	PI138A	**$229.00**
4 to 1	PI140A	**$315.00**
6 to 2	PI150A	**$395.00**
remember to order cables DB25 Extension Cable, 10-ft. (3.0-m) Male/Male	BC00706	**$14.95**
For other lengths and genders, see p. 105.		
Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**
For other lengths and genders, see p. 106.		

* * *

Parallel Link Printer Sharer

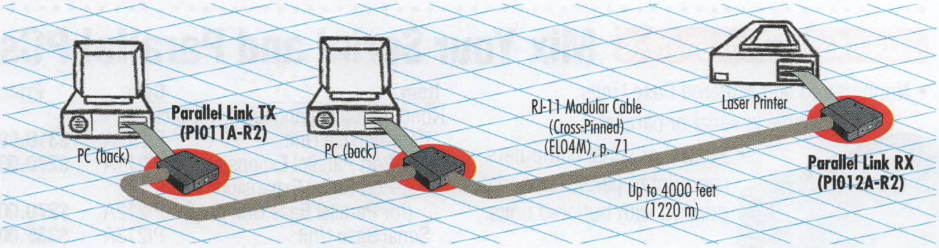
Share One Printer with up to 31 PCs—up to 4000 Feet Away.

BUSY
POWER
TO COMPUTER
PARALLEL LINK-TX
BLACK BOX®

- **The most distance you can get with parallel.**
- **Fast throughput—250 Kbps.**
- **No software needed.**
- **Use inexpensive RJ-11 cables.**

Attach the Transmitter to your PC's parallel port and the Receiver to your printer's 36-pin Centronics® female port. Then connect the Receiver to your network. Instantly, you're ready to share. Up to 31 PCs print: first come, first served.

With the End-of-File timeout switch, you can select a 7-, 10-, 16-, or 42-second timeout for each PC to reduce downtime.


Parallel Link TX (PI011A-R2)
PC (back)
PC (back)
RJ-11 Modular Cable (Cross-Pinned) (EL04M), p. 71
Laser Printer
Up to 4000 feet (1220 m)
Parallel Link RX (PI012A-R2)

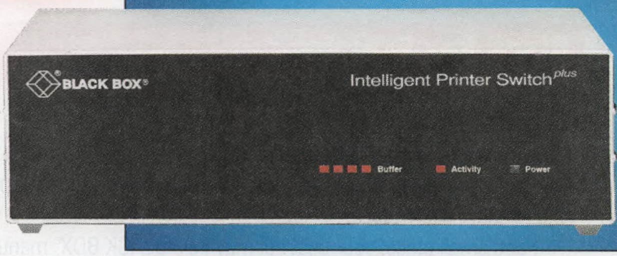
FAXBACK INFORMATION
Request Document Number: 10724
Call 412-746-5500 Anytime

SPECIFICATIONS

Data Format — 8 data bits
Flow Control — Busy and Acknowledge
Speed — 20,000 cps
Transmission Distance — Up to 4000 ft. (1220 m)
Interface — Centronics compatible
Connectors — PI011A: (1) DB25 male, (2) RJ-11 jacks; PI012A: (1) RJ-11 jack, (1) Centronics 36-pin male
Indicators — 2 LEDs: (1) Power on, (1) Busy
Power — 9-VDC 200-mA adapter
Size — 4.1"H x 3.2"W x 1"D (10.4 x 8.1 x 2.5 cm)
Weight — PI011A: 1.6 lb. (0.7 kg); PI012A: 1.1 lb. (0.5 kg)

NOTE: The Parallel Link come with one 25-ft. (7.6-m) RJ-11 Cable.

Item	Code	Price
Parallel Link TX	PI011A-R2	**$115.00**
RX	PI012A-R2	**$115.00**
remember to order cables RJ-11 (4-Wire) Modular Cable, 7-ft. (2.1-m) Straight-Pinned	EL04M-07	**$2.95**
For other lengths and pinnings, see p. 71.		



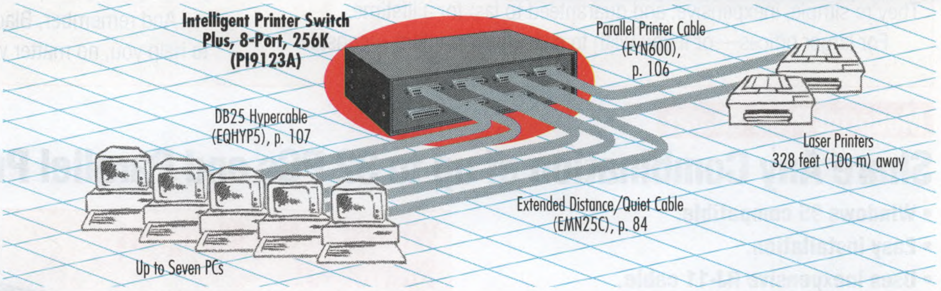
Intelligent Printer Switch Plus

Flexible Sharing for Two Printers and up to Seven Users.

- Extremely fast—55,000 cps parallel or 57,600 bps serial.
- Broadcast to both printers simultaneously, or to the first printer available.
- Locate parallel printers up to 328 feet (100 meters) away—wherever it's convenient.
- Compatible with all popular software—including Windows® and graphics packages.
- Includes ADMODE® software to accelerate serial-port performance.

SPECIFICATIONS

Distance — 328 ft. (100 m) maximum
Handshake — CTS/DTR hardware X-ON, X-OFF
Parallel Throughput — 55,000 cps
Ports — Parallel 6-Port: (4) input, (1) output, (1) autoswitchable in/output; provides 4-to-2 or 5-to-1 operation;
Parallel 8-Port: (6) input, (1) output, (1) autoswitchable in/output; provides 6-to-2 or 7-to-1 operation;
Serial 6-Port: Same as Parallel 6-Port but with bidirectional serial ports;
Serial 8-Port: Same as Parallel 8-Port but with bidirectional serial ports
Speed — Parallel: Up to 55,000 cps;
Serial: 300, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600 bps
Connectors — Serial/parallel DB25 female
CE Approval — PI9145–PI9146; 230-VAC versions: PI1920AE-PI9131AE, PI9140AE–PI9141AE
Power — 115/230 VAC, 60/50 Hz, from external power supply
Size — 3"H x 10.2"W x 5.5"D (7.6 x 25.9 x 14 cm)
Weight — 3.3 lb. (1.5 kg), including power supply


Intelligent Printer Switch Plus, 8-Port, 256K (PI9123A)
Parallel Printer Cable (EYN600), p. 106
DB25 Hypercable (EQHYP5), p. 107
Laser Printers 328 feet (100 m) away
Extended Distance/Quiet Cable (EMN25C), p. 84
Up to Seven PCs

Item	Code	Price
Intelligent Printer Switch Plus		
Parallel		
6-Port 256K	PI9120A	**$450.00**
1M	PI9121A	**$520.00**
2M	PI9122A	**$640.00**
4M	PI9140A	**$1080.00**
8-Port 256K	PI9123A	**$475.00**
1M	PI9124A	**$550.00**
2M	PI9125A	**$670.00**
4M	PI9141A	**$1110.00**
Serial		
6-Port 256K	PI9126A	**$550.00**
1M	PI9127A	**$625.00**
2M	PI9128A	**$750.00**
8-Port 256K	PI9129A	**$595.00**
1M	PI9130A	**$670.00**
2M	PI9131A	**$790.00**
Memory Expansion		
1-MB	PI9145	**$295.00**
2-MB	PI9146	**$450.00**

Item	Code	Price
remember to order cables DB25 Hypercable 30-ft. (9.1-m) Male/Male	EQHYP4-0030	**$70.00**
For other lengths and genders, see p. 107.		
ED/Q Cable 50-ft. (15.2-m)	EDN25C-0050	**$56.95**
For other lengths, see p. 84.		
Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**
For other lengths and genders, see p. 106.		
AT® Serial Printer Cable 6-ft. (1.8-m)	EVMBPC-0006	**$8.95**
For other lengths and genders, see p. 108.		
PC/XT™ Serial Printer Cable 6-ft. (1.8-m)	BC00901	**$6.95**
For other lengths and genders, see p. 108.		

Buffered AutoSwitch

Share Your Parallel Printer with up to Eight PCs—And Get Built-In Buffering.

- **Connect up to eight PCs to one printer with standard parallel printer cable.**
- **Built-in buffering releases PCs from print jobs.**
- **Ideal for Windows® applications.**

How big are your print jobs? If they vary in size and you have an office of up to eight people, consider our Buffered AutoSwitch.

The high-speed Buffered AutoSwitch from Black Box ensures fast, error-free printing with no waiting. With its 1-MB buffer, this Switch is designed for complex print jobs. The Buffered AutoSwitch will boost your productivity by sharing your parallel printer with 2, 4, or 8 PCs. The built-in buffer frees PCs in seconds, too.

The Buffered AutoSwitch also works flawlessly with complex Windows® print jobs, Windows 95, PostScript® print jobs, and graphics-generating software.

BLACK BOX (412) 746-5500
BUFFERED AUTOSWITCH
PRINTER
DC INPUT
9V/1A
ON
OFF

FAXBACK INFO
Request Document Number: 13521
Call 412-746-5500
Anytime

SPECIFICATIONS

Data Format — 8 bits, transparent
Diagnostics — Power-up self-test
Flow Control — Hardware (Busy, Busy/ACK)
Memory — 1 MB
CE Approval — 230-VAC versions: PI390AE–PI392AE
Interface — Centronics and IBM® PC parallel compatible
Connectors — Input: (2), (4), or (8) 36-pin Centronics female;
Output: (1) DB25 female
Indicators — 1-segment display for Power-up, Ready, and Port Activity Status
Power — 115 VAC, with plug-in adapter (115 VAC to 9 VDC UL® and CSA)
Size — 2-Port: 2.2"H x 8.7"W x 4.3"D (5.6 x 22.1 x 10.9 cm);
4-Port: 3"H x 8.7"W x 4.3"D (7.6 x 22.1 x 10.9 cm);
8-Port: 4.5"H x 8.7"W x 4.3"D (11.4 x 22.1 x 10.9 cm)
Weight — 2-Port: 4.2 lb. (1.9 kg);
4-Port: 4.8 lb. (2.2 kg); 8-Port: 6.2 lb. (2.8 kg)

Item	Code	Price
Buffered AutoSwitch		
2-Port	PI390A	**$435.00**
4-Port	PI391A	**$535.00**
8-Port	PI392A	**$695.00**
remember to order cables Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**
For other lengths and genders, see p. 106.		

Black Box Explains...

Sharing Printers without a LAN.

If you want to share printers but don't have the resources or the need for a LAN, Black Box switches and print sharers offer inexpensive and effective alternatives.

For a small office, your best bet may be a BLACK BOX® manual switch. They're simple, inexpensive, and guaranteed to last for a lifetime.

For larger offices—or if you wish to share laser printers—consider either a print sharer or an electronic switch. Both can handle your more complex applications and are gentle on delicate HP® laser-printer circuits.

But, if you expect major expansion in the future or if you want e-mail capabilities, you may want to go the whole route and set up a simple 10BASE-T network. Installing a network is easier and less expensive than you might expect—see **page 583** in our LAN section.

And remember, Black Box Technical Support Experts are always here to help you, no matter which printing solution you choose.

Modprint Print-Sharer

Share Any Combination of up to 32 PCs and Parallel Printers.

- **Windows 95 compatible.**
- **Easy installation.**
- **Uses inexpensive RJ-11 cable.**
- **Adapts to office layout.**

Share any combination of up to 32 PCs and parallel printers. Just plug a Computer Module into a PC's parallel printer port and a Printer Module into your printer's parallel port. Connect them with the included RJ-11 cable—it's as easy as plugging in a phone.

With a single printer, it's completely transparent, compatible with Windows®, and needs no configuration. For multiple printers, use the pop-up software to choose a printer.

The Print-Sharer is ideal for the smaller office that's not yet ready for a full LAN. And it's fast. Your PC won't get bogged down in big print jobs. You can get fast data throughput at up to 30,000 cps.

FAXBACK INFORMATION
Request Document Number: 13442
Call 412-746-5500 Anytime

What's in the Modprint Starter Kit.

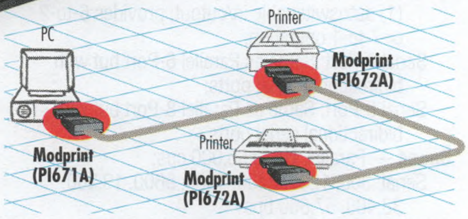
We've included everything you need for instant printer-sharing—at a great price.

- (2) Computer Modules
- (2) 25-ft. (7.6-m) RJ cables
- Printer Module
- AC Adapter
- Software

SPECIFICATIONS

Maximum Distance — Up to 1000 ft. (305 m) between modules; 1200 ft. (366 m) total
Maximum Number of Modules — 32
Speed — 500 Kbps, CRC error detection
System Requirements — IBM® or compatible PC; DOS 3.0 or higher; parallel printer
CE Approval — PI671A–PI672A; 230-VAC version: PI670AE
Connectors — All: (2) RJ-11 female; PI671A: DB25 male; PI672A: Centronics® connector for standard parallel printer port
Power — 12 VDC, 500 mA (International version available)
Size — Modules: 3"H x 2"W x 0.5"D (7.6 x 5.1 x 1.3 cm)

MODPRINT
For IBM PC/AT®/System 2® and compatibles.
Utilities Disk
BLACK BOX®
MODPRINT COMPUTER MODULE
MODPRINT PRINTER MODULE



NOTE: Modprint Modules include 25-foot (7.6 m) RJ-11 cables.

Item	Code	Price
Modprint Starter Kit	PI670A	**$199.00**
Computer Module	PI671A	**$59.00**
Printer Module	PI672A	**$69.00**
remember to order cables RJ-11 (4-Wire) Modular Cable, 7-ft. (2.1-m) Straight-Pinned	EL04MS-07	**$2.95**

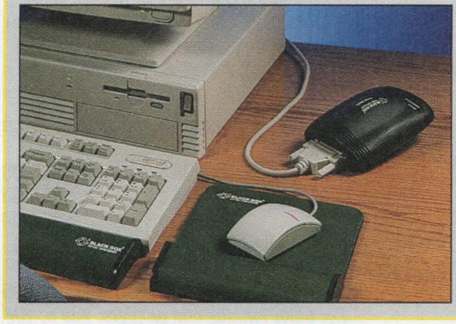
For other lengths and pinnings, see p. 71.

• NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ •

Print Genie

Share Printers without Cables!

- **Spread-Spectrum wireless modulation ensures top speed, integrity, security.**
- **Line-of-sight links to 3000 ft. (914 m), or 500 ft. (152 m) *through office walls.***
- **Uses the 2400- to 2483.5-MHz radio band. No FCC license required.**



Link one PC to one printer, or share up to eight printers with an unlimited number of PCs. Installation's easy and totally wireless. Just plug one Print Genie into each shared device. Start with the Double Pack, then order Single Packs to expand your wireless printer network.

Print Genie converts PC data into radio signals, then spreads them out across the available bandwidth, bypassing radio interference to ensure that the data gets through.

SPECIFICATIONS

Speed — Up to 1 Mbps
Interface — Parallel
Connectors — (1) DB25 male; includes (1) DB25 male to 36-pin Centronics adapter
Power — 115 VAC, 60 Hz
Size — 1.8"H x 4.5"W x 7"D (4.6 x 11.4 x 17.8 cm)
Weight — 2.5 lb. (1.2 kg)

The Print Genie plugs right into your printer and requires no extra cable.

FAXBACK INFORMATION
Request Document Number: 15341
Call 412-746-5500 Anytime

Item	Code	Was	NOW!
Print Genie			
Double Pack	PI770A	~~$449.00~~	$349.00
Single Pack	PI771A	~~$269.00~~	$179.00

Top: SL017A (front);
Middle: SL017A (back);
Bottom: SL010A (front)

MicroSwitch

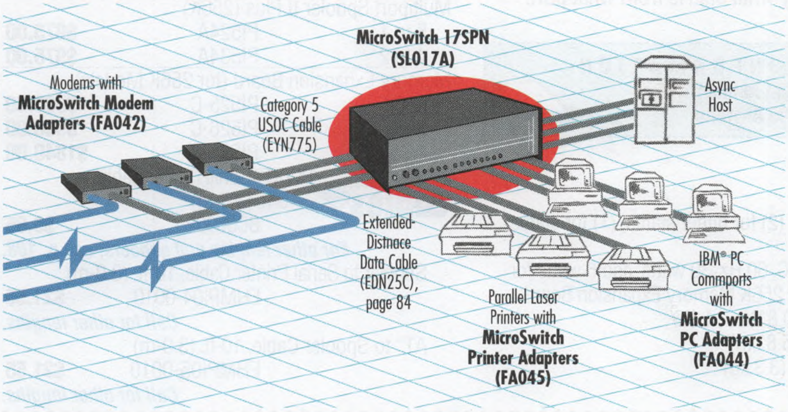
Maximum Versatility, Minimum Cost.

- **The smart-priced choice for office automation, CAD/CAM, machine control, data collection, local area networking, telecommunications, and retail POS.**
- **Includes 64-KB memory buffer that can be expanded up to 4 MB.**
- **Comes in several models with up to 17 ports—serial, parallel, or combos of both.**
- **Easy-configuration menu system makes setup simple.**
- **Standalone or rackmountable models.**

No matter the work environment, the BLACK BOX® MicroSwitch gives you the power and versatility you need from a sub-LAN—without the extra expenses of network operating software, servers, and network interface cards.

It's automatic.

To use MicroSwitch in a sub-LAN application, just order the MicroSwitch LAN Software. It does file transfer, e-mail, and more. Even without the LAN Software, MicroSwitch can spool data from several input devices (like PCs) before sending it on to printers.



It's expandable.

Standard memory is 64 KB, dynamically allocated. You can expand with 256-KB, 512-KB, or 1-MB Expansion Boards. Total memory capacity is 4 MB. And eight models are available, from 3 ports up to 17, in serial, parallel, or combinations of both. You can choose exactly the model for your system.

It's up to the demand.

MicroSwitch can also handle port contention for a host or a modem without the need for a PC. You can share hosts just by connecting terminals.

A simple status command lets you see queued jobs by source, destination, status, priority, and length. Up to 64 jobs can be queued at once. Timeouts keep one PC or terminal from monopolizing a printer. Be sure to order the appropriate MicroSwitch Adapters for your application from the list **below**.

Item	Ports	Connectors	Code	Price
MicroSwitches				
3SP	(3) Serial or Parallel	(3) DB25 Female; (3) RJ-45 Female	SL001A	**$425.00**
5S	(5) Serial	(5) DB25 Female	SL003A	**$649.00**
5P	(5) Parallel	(5) 36-Pin Centronics®	SL005A	**$649.00**
6SP	(6) Serial or Parallel	(6) DB25 Female; (6) RJ-45 Female	SL007A	**$695.00**
9P	(9) Parallel	(9) 36-Pin Centronics	SL009A	**$849.00**
9S	(9) Serial	(9) DB25 Female	SL010A	**$875.00**
9SP	(9) Serial or Parallel	(9) DB25 Female; (9) RJ-45 Female	SL015A	**$975.00**
17SPN	(16) Serial, (1) Parallel	(16) RJ-45 Female; (1) DB25 Female	SL017A	**$1945.00**

Item	Code	Price
Memory Expansion Boards		
256K	SL012-C	**$154.00**
512K	SL013-C	**$205.00**
1-MB	SL014-C	**$310.00**
MicroSwitch Adapters		
Modem (DB25M–RJ-45)	FA042	**$10.20**
AT® (DB9F–RJ-45)	FA043	**$10.20**
PC (DB25M–RJ-45)	FA044	**$10.20**
Printer (DB25M–RJ-45)	FA045	**$10.20**
MicroSwitch Rackmount Bracket	RM014A	**$62.00**
MicroSwitch LAN Software (4 Users)	SL016	**$102.00**

remember to order cables

Item	Code	Price
For Parallel Connections...		
Extended-Distance Data Cable 50-ft. (15.2-m)	EDN25C-0050	**$56.95**
For other lengths, see p. 84.		
For Serial Connections...		
Category 5 Cable, 10-ft. (3.0-m) USOC, PVC, Stranded	EYN775-0010	**$11.95**
Call for other lengths.		

SPECIFICATIONS

Buffer — Up to 4 MB with Memory Expansion Board

Data Format — 5–8 bits, 1–2 stop bits; odd, even, mark, space, or no parity (user-programmable)

Flow Control — Serial ports: DTR/DSR or X-ON/X-OFF to buffer (user-programmable); ports configured as modems support DCD passthrough;
Parallel ports: Hardware handshaking, Busy, Acknowledge

Speed — 50 bps to 19.2 Kbps, selectable

CE Approval — 230-VAC versions: SL001AE, SL003AE, SL005AE, SL007AE, SL009AE

Indicators — LEDs: (1) Power, (1) Buffer, (1) Data, (1) Busy, (9) Port Activity; Select and Advance switches

Power — 115 VAC, 60 Hz

Size — 3.5"H x 10.5"W x 5"D (8.9 x 26.7 x 12.7 cm)

Weight — 6 lb. (2.7 kg)

MicroSwitch LAN Software

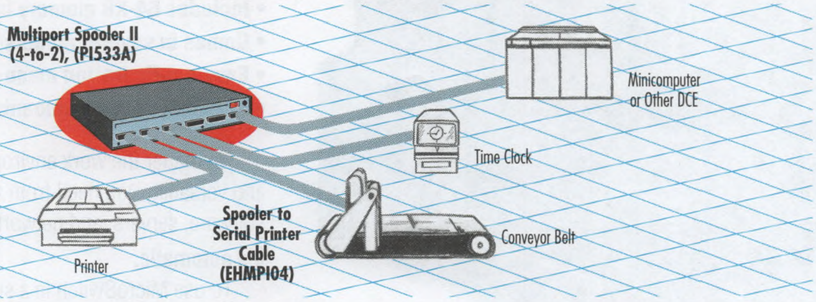
File-sharing, e-mail, and more—without a LAN!

To send e-mail, transfer files, and browse through peer files and directories with your MicroSwitch, just add our MicroSwitch LAN Software. It requires only 60 KB of memory. Each package supports four users.

Multiport Spooler II

The Industrial Spooler for Both PC and Non-PC Equipment.

- **Perfect for electronic scales, lathes, temperature probes, and PC equipment.**
- **Configuration is fast and easy—just set the Spooler's switches.**
- **Five users can share one printer, or four users can share two printers.**


Multiport Spooler II (4-to-2), (PI533A)
Minicomputer or Other DCE
Time Clock
Spooler to Serial Printer Cable (EHMPI04)
Printer
Conveyor Belt

Use the BLACK BOX® Multiport Spooler II to interface between your PC and your non-PC equipment (such as electronic scales, lathes, or temperature probes). Send data directly to your computer monitor or printer. You can easily tailor this Spooler to your specific needs—just flip a switch. Ensure data-flow compatibility by setting word structure, form feeds, and speeds. There's no complicated configuration—you don't even need a PC or software. Just set the switches right on the unit. The Spooler also labels the ports so you know exactly what data is from what port.

FAXBACK INFORMATION
Request Document Number: 10827
Call 412-746-5500 Anytime

SPECIFICATIONS

Data Format — 7 data bits, even or odd parity; 8 data bits, no parity; 1, 1½, or 2 stop bits
Flow Control — Hardware handshaking (Input Pin 5 or 8; Output Pin 20) and software (X-ON/X-OFF)
Speed — Up to 38.4 Kbps
Interface — RS-232 asynchronous, ASCII (DTE)
Connectors — (6) DB25 female
Indicators — (8): (2) for buffer status, (1) for status of each port
Power — 115 VAC, 60 Hz, 30 watts; add 6 watts for each additional 256K Memory Expansion Board
Size — 2.5"H x 10.8"W x 14.1"D (6.4 x 27.4 x 35.8 cm)
Weight — 7.3 lb. (3.3 kg)

Item	Code	Price
Multiport Spooler II (64K)		
5 to 1	PI523A	**$670.00**
4 to 2	PI533A	**$770.00**
Multiport Spooler II Plus (256K)		
5 to 1	PI524A	**$975.00**
4 to 2	PI534A	**$975.00**
Memory Expansion Board (for 256K Models)		
256K	PI525-C	**$360.00**
786K	PI526-C	**$900.00**
1.75 MB	PI527-C	**$1840.00**
remember to order cables PC/XT™ Serial Printer Cable 6-ft. (1.8-m)	BC00902	**$9.95**
For other lengths and genders, see p. 108.		
Spooler to Serial Printer Cable, 10-ft. (3.0-m)	EHMPI04-0010	**$21.55**
Call for other lengths.		
AT® to Spooler Cable, 10-ft. (3.0-m)	EHMPI05-0010	**$21.55**
Call for other lengths.		

◆ ◆ ◆

Multiport Spooler VII

Share Two Parallel and Two Serial Printers among Four, Eight, or Twelve Users.

- **Daisychain up to nine Spoolers with our Cascading Cable.**
- **Full range of speeds—300 bps to 115.2 Kbps—with Windows® or DOS software.**
- **256-KB buffer upgradable to 16 MB.**

Use the BLACK BOX® Multiport Spooler VII to share up to 2 serial and 2 parallel printers among 4, 8, or 12 PCs. Each model has one parallel printer port. Use our Serial↔Parallel Converter III to convert the parallel port to a serial port for connection to serial cables. Then use our Serial to RJ Adapters to link to your PCs, and then link your PCs to the Spooler with inexpensive twisted-pair cable. To cascade two or more Spoolers, order our Cascading Cable.

SPECIFICATIONS

Speed — Input ports: User-configurable up to 115.2 Kbps;
Serial output ports: To 38.4 Kbps
Connectors — All: (2) DB25; PI720A-R2: (6) RJ-11; PI721A-R2: (10) RJ-11; PI722A-R2: (14) RJ-11
Memory — 256 KB standard, upgradable to 16 MB
Size — 2.5"H x 9.8"W x 7.3"D (6.4 x 24.9 x 18.5 cm)
Weight — 3 lb. (1.4 kg)

Item	Code	Price
Multiport Spooler VII		
4-Port	PI720A-R2	**$499.00**
8-Port	PI721A-R2	**$629.00**
12-Port	PI722A-R2	**$729.00**
Serial to RJ Adapters		
DB25F/RJ-11	PI723A	**$9.95**
DB9F/RJ-11	PI724A	**$9.95**
DB25M/RJ-11	PI725A	**$9.95**
Memory Expansion		
256 KB	PI726A	**$49.00**
1 MB	PI727A	**$99.00**
4 MB	PI728A	**$459.00**

Item	Code	Price
You may also need:		
Serial↔Parallel Converter III	PI115A	**$135.00**
For more details, see p. 297.		
remember to order cables Multiport Spooler VII Cascading Cable	EHN066	**$7.20 + $ .13/ft.**
RJ-11 (4-Wire) Modular Cable, 7-ft. (2.1-m) Straight-Pinned	EL04MS-07	**$2.95**
For other lengths and pinnings, see p. 71.		

BUYER'S GUIDE

FOR COMPARISON: MULTIPORT SPOOLERS

Item	Speed	Memory	Users	Printers	Serial/Parallel	Page
Multiport VIII	Up to 38.4 Kbps	Up to 4 MB	Up to 23	Up to 23	Both	**321**
Multiport VI	Serial: Up to 38.4 Kbps Parallel: 12,000 cps	Up to 4 MB	Up to 15	Up to 15	Both	**323**
Multiport IV	9600 bps	Up to 1 MB	Up to 5	1	Both	**323**

Multiport Spooler VIII

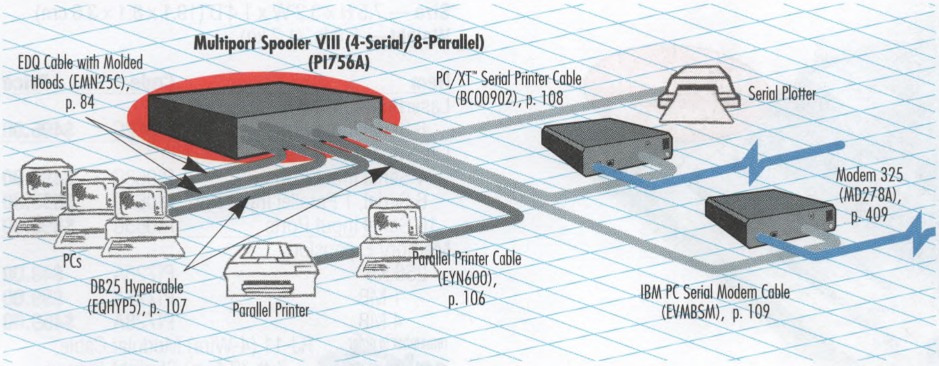
Share Modems, Printers, Fax Modems, and More—without a High-Cost LAN!

BLACK BOX
(412) 746-5500
MULTIPORT SPOOLER VIII
POWER
TECH SUPPORT'S PRODUCT OF CHOICE

- **Windows® 95 compatible.**
- **MPS VIII print utility included for seamless printer selection directly from your applications.**
- **Choose bidirectional serial ports, programmable parallel ports, "input" or "output," or a combination.**
- **1- or 4-MB buffer.**

The Multiport Spooler VIII offers intelligent port-to-port peripheral management so you can share a mix of PCs and peripherals. Each port is independently programmable and can exactly match access requirements of the most specialized peripherals and applications. There's no waiting—all ports transfer data simultaneously! **Share one modem** or external fax modem, **or pool several modems**, and give access to the first available one. Cut your telephone costs!

The spooler works independently of disk-operating systems. Connect to PCs, terminals, file servers, minicomputers, or mainframes. Other features include password-protected configuration, user-defined memory reservation, selectable baud and flow control—even broadcast to selected ports!


Multiport Spooler VIII (4-Serial/8-Parallel) (PI756A)
EDQ Cable with Molded Hoods (EMN25C), p. 84
PC/XT™ Serial Printer Cable (BC00902), p. 108
Serial Plotter
Modem 325 (MD278A), p. 409
PCs
DB25 Hypercable (EQHYP5), p. 107
Parallel Printer
Parallel Printer Cable (EYN600), p. 106
IBM PC Serial Modem Cable (EVMBSM), p. 109

SPECIFICATIONS

Flow Control — CTS/DTR or X-ON/X-OFF
Speed — 300 bps to 38.4 Kbps
CE Approval — 230-VAC versions: PI750AE–PI751AE, PI754AE, PI755AE, PI760AE–PI761AE, PI764AE, PI765AE–PI766AE
Interface — Serial or parallel
Connectors — Serial ports: DB25 male; Parallel ports: DB25 female
Power — 115 VAC, 60 Hz
Size — 4"H x 12"W x 17.5"D (10.2 x 30.5 x 44.5 cm)
Weight — 17 lb. (7.7 kg)

FAXBACK INFORMATION
Request Document Number: 13514
Call 412-746-5500 Anytime

Item	Code	Price
Multiport Spooler VIII with 1-MB Buffer		
Parallel Ports Only		
4-Port	PI750A	**$545.00**
8-Port	PI751A	**$805.00**
12-Port	PI752A	**$1215.00**
24-Port	PI753A	**$1995.00**
Serial Ports Only		
4-Port	PI754A	**$545.00**
Both Serial and Parallel Ports		
4 Serial, 4 Parallel	PI755A	**$805.00**
4 Serial, 8 Parallel	PI756A	**$1215.00**
12 Serial, 12 Parallel	PI757A	**$1995.00**
6 Serial, 18 Parallel	PI758A	**$1995.00**
Multiport Spooler VIII with 4-MB Buffer		
Parallel Ports Only		
4-Port	PI760A	**$1025.00**
8-Port	PI761A	**$1285.00**
12-Port	PI762A	**$1695.00**
24-Port	PI763A	**$2475.00**
Serial Ports Only		
4-Port	PI764A	**$1025.00**
Both Serial and Parallel Ports		
4 Serial, 4 Parallel	PI765A	**$1285.00**
4 Serial, 8 Parallel	PI766A	**$1695.00**
12 Serial, 12 Parallel	PI767A	**$2475.00**
6 Serial, 18 Parallel	PI768A	**$2475.00**
remember to order **cables** DB25 Hypercable 30-ft. (9.1-m) Male/Male	EQHYP4-0030	**$70.00**
For other lengths and genders, see p. 107.		
ED/Q Cable 50-ft. (15.2-m)	EDN25C-0050	**$56.95**
For other lengths, see p. 84.		
Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**
For other lengths and genders, see p. 106.		
PC/XT™ Serial Printer Cable 10-ft. (3.0-m)	BC00902	**$9.95**
For other lengths and genders, see p. 108.		

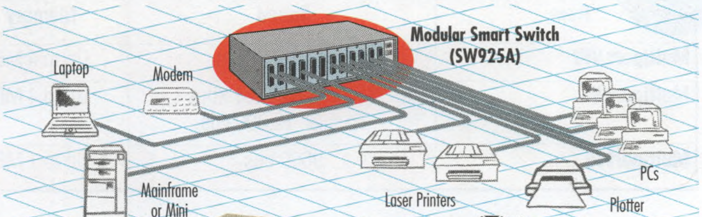
Modular Smart Switch

Now Share Peripherals among 12 Users up to 300 Feet Away!

- **Provides fast, easy, bidirectional file transfer between PCs.**
- **Supports data broadcasts to multiple ports.**
- **Easy to operate—pull-down software menu or download code.**
- **Start with a Base Unit, then add up to 12 serial RS-232/422 or parallel ports, and 4 MB of memory.**
- **Delivers 30,000 cps throughput—no waiting for file transfers.**

Use this expandable Switch to solve your peripheral-sharing interconnection problems. Configure the basic Chassis with up to six Dual-Port Modules to share one peripheral among 12 devices. Add Memory Expansion Modules (up to 4 MB total) to increase the Switch's data buffer and speed throughput. This flexibility enables you to set up the Switch to match virtually any application.

Attach the Switch to either the serial or parallel port of your PC (for even greater flexibility). Once connected, Modular Smart Switch significantly reduces the processing delays that can idle a PC as data spools to the shared device. It's especially useful for data-intensive applications such as Windows®, DTP, and CAD packages. The ADMODE software (included) accelerates the performance of the combined RS-232/422 ports, so the serial ports of connected devices can reach speeds of up to 57.6 Kbps. And unlike some sharing devices, the Modular Smart Switch can drive certain laser printers up to 3280 ft. (1000 m) without signal boosters.



EXCLUSIVE
BLACK BOX
Modular Smart Switch
115V.
BUFFER
POWER
12 11 10 9 8 7 6 5 4 3 2 1

FAXBACK INFO
Request Document Number: 15853
Call 412-746-5500
Anytime

SPECIFICATIONS

Handshake — CTS/DTR hardware X-ON/X-OFF, ETX/ATK
Speed — 300, 1200, 2400, 4800, and 9600 bps; 19.2, 38.4, and 57.6 Kbps
Timeout — User-selectable from 1 to 255 seconds
CE Approval — SW926C–SW929C; 230-VAC version: SW925AE
Connectors — Parallel Modules: (2) DB25 female; Serial Modules: (2) DB25 male
Indicators — (17) LEDs: (1) Power, (4) Buffer Status, (12) Channel Activity
Power — 115 VAC, 60 Hz
Size — 3.5"H x 13.2"W x 9.4"D (8.9 x 33.5 x 23.9 cm)
Weight — 7.5 lb. (3.4 kg)

Item	Code	Price
First, order the Smart Switch Chassis (software included)...		
Modular Smart Switch Chassis (1 MB)	SW925A	**$569.00**
...Next, select the Port Modules to fit your system (one Chassis holds up to six)...		
Dual Serial RS-232/422 Port Module Bidirectional (2) DB25 Male Connectors	SW926C	**$110.00**
Dual Parallel Port Module In/Out Selectable (2) DB25 Female Connectors	SW927C	**$110.00**
...Finally, to add more memory, choose:		
Memory Expansion Module		
1-MB	SW928C	**$159.00**
2-MB	SW929C	**$315.00**
remember to order cables: DB25 Null Modem Cable, 6-ft. (1.8-m)	BC00501	**$12.95**
AT Modem Cable, 6-ft. (1.8-m)	BC00301	**$12.95**

For other lengths, see p. 109.

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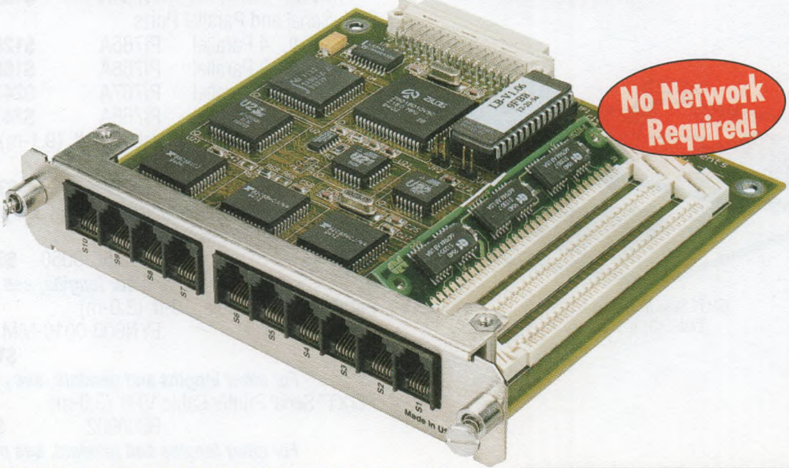
LaserBoards

Yes! Ten People Can Share One LaserJet!

- With LaserBoard III, up to eight users can share a laser printer with an XIO slot.
- With LaserBoard IV, up to ten users can share a laser printer with an MIO slot.
- Uses inexpensive RJ-11 telephone cable instead of expensive parallel-printer cable.
- Configurable for two additional printers.
- Expandable buffers.



SPECIFICATIONS

Data Format — 8 data bits, no parity
Memory — PI062C: 256 KB, expandable to up to 1.2 MB; PI063C–PI065C: 1 MB, expandable to up to 12 MB
Speed — Up to 115.2 Kbps
Size — 7.5"H x 3.2"W x 1.4"D (19.1 x 8.1 x 3.6 cm)
Weight — 2.6 lb. (1.2 kg)

Item	Code	Price
LaserBoard III (XIO)		
8 Serial Input Ports	PI062C	**$495.00**
LaserBoard IV (MIO)		
4 Serial Input Ports	PI063C	**$495.00**
6 Serial, 1 Parallel Input Port	PI064C	**$595.00**
10 Serial Input Ports	PI065C	**$695.00**
Memory Expansion		
256 KB	PI726A	**$49.00**
1 MB	PI727A	**$99.00**
4 MB	PI728A	**$459.00**
remember to order cables: RJ-11 (4-Wire) Modular Cable, 7-ft. (2.1-m) Straight-Pinned	EL04MS-07	**$2.95**

For other lengths and pinnings, see p. 71.

Multiport Spooler VI

Serial or Parallel Spooling for Larger Workgroups.

- **Accepts data on all input ports at once.**
- **Cascade to add more ports.**

Combine parallel and serial equipment with the Multiport Spooler. Configure ports easily: With the included Windows® and DOS-compatible software, you can configure temporary changes—while still in your application program.

Item	Code	Price
Multiport Spooler VI		
1 MB (Expandable to 4 MB)		
6-Port		
6 Serial	PI546A-R2	**$695.00**
6 Parallel	PI545A-R2	**$695.00**
4 Serial/2 Parallel	PI547A-R2	**$695.00**
10-Port		
10 Serial	PI541A-R2	**$795.00**
6 Serial/4 Parallel	PI540A-R2	**$795.00**
16-Port		
16 Serial	PI544A-R2	**$1295.00**
12 Serial/4 Parallel	PI543A-R2	**$1295.00**
4 Serial/12 Parallel	PI542A-R2	**$1295.00**
256 KB (Expandable to 1 MB)		
6-Port		
6 Serial	PI562A-R2	**$595.00**
6 Parallel	PI576A-R2	**$595.00**
4 Serial/2 Parallel	PI571A-R2	**$595.00**
Multiport Spooler VI (Continued)		
10-Port		
10 Serial	PI591A-R2	**$695.00**
6 Serial/4 Parallel	PI581A-R2	**$695.00**
16-Port		
16 Serial	PI592A-R2	**$1195.00**
12 Serial/4 Parallel	PI593A-R2	**$1195.00**
4 Serial/12 Parallel	PI594A-R2	**$1195.00**
Memory Expansion Board		
256K	PI565-C	**$115.00**
1-MB	PI566C-R2	**$165.00**

remember to order cables

Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**

For other lengths and genders, see p. 106.

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Multiport Spooler IV

Five People Can Share One Printer—with Existing Parallel Cable.

- **256-KB buffer is expandable to 1 MB.**
- **Comes in your choice of parallel or serial interfaces.**

The BLACK BOX® Multiport Spooler IV is the low-cost way to keep your PCs busy working, not printing. Five PCs can send print files at one time. The Multiport Spooler IV stores the jobs in its buffer, freeing your PCs to do other work. And if you print large files regularly, you can expand the 256K buffer to 1 MB.

Easy to set up, easy to use—no complicated installation procedures like setting DIP switches or configuring software. Just connect your five PCs, minis, or other computers to the Spooler and it's ready to go!

The Multiport Spooler IV offers a parallel-port option, so you can connect your PCs over your existing parallel cable—and save!

FAXBACK INFORMATION
Request Document Number: 10779
Call 412-746-5500 Anytime

Item	Code	Price
Multiport Spooler IV		
Serial	PI553A	**$395.00**
Parallel	PI554A	**$395.00**
4 Serial In, 1 Parallel In, 1 Parallel Out (4S2P)	PI552A	**$395.00**
256K Memory Expansion Board	PI565-C	**$115.00**

remember to order cables

Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**

For other lengths and genders, see p. 106.

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Turbo Spooler

Spools Faster than Your Network—100,000 cps!

- **This spooler is built for *fast* printers.**
- **Serial or parallel—up to 10 ports.**
- **Prints all jobs, even graphics, in seconds.**
- **Expands to 4 MB.**

The BLACK BOX® Turbo Spooler operates at up to 100,000 characters per second—to handle even the fastest devices.

The Turbo Spooler uses the unique Uniport technology. Uniport Adapters convert your computer's parallel ports to high-speed serial and connect them to the Turbo Spooler. So you can integrate all your equipment—serial or parallel—within the same printer-sharing system.

Ordinary parallel connections are limited to 20 feet (6 m). But Uniport parallel distances run up to 4000 feet (1220 m)—200 times farther.

SPECIFICATIONS

Memory — 1 MB upgradable to 4 MB
Speed — Input/output: 110 bps to 115.2 Kbps, selectable;
Parallel: Up to 100,000 cps output
Standards — Serial: Async RS-232;
Parallel: Centronics®
Connectors — Both models: (2) DB25 output-only parallel;
PI620A-R2: (4) Uniports (RJ-45);
PI621A-R2: (8) Uniports (RJ-45)
Power — 115 VAC/60 Hz or 230 VAC/50 Hz
Size — 2.6"H x 13.3"W x 8"D (6.6 x 33.8 x 20.3 cm)

Item	Code	Price
Turbo Spooler		
6-Port	PI620A-R2	**$895.00**
10-Port	PI621A-R2	**$1295.00**
Serial Memory Expansion		
1-MB	PI566C-R2	**$165.00**
Uniport Adapters		
Parallel	PI622A	**$110.00**
MPS VI	FA019	**$11.25**

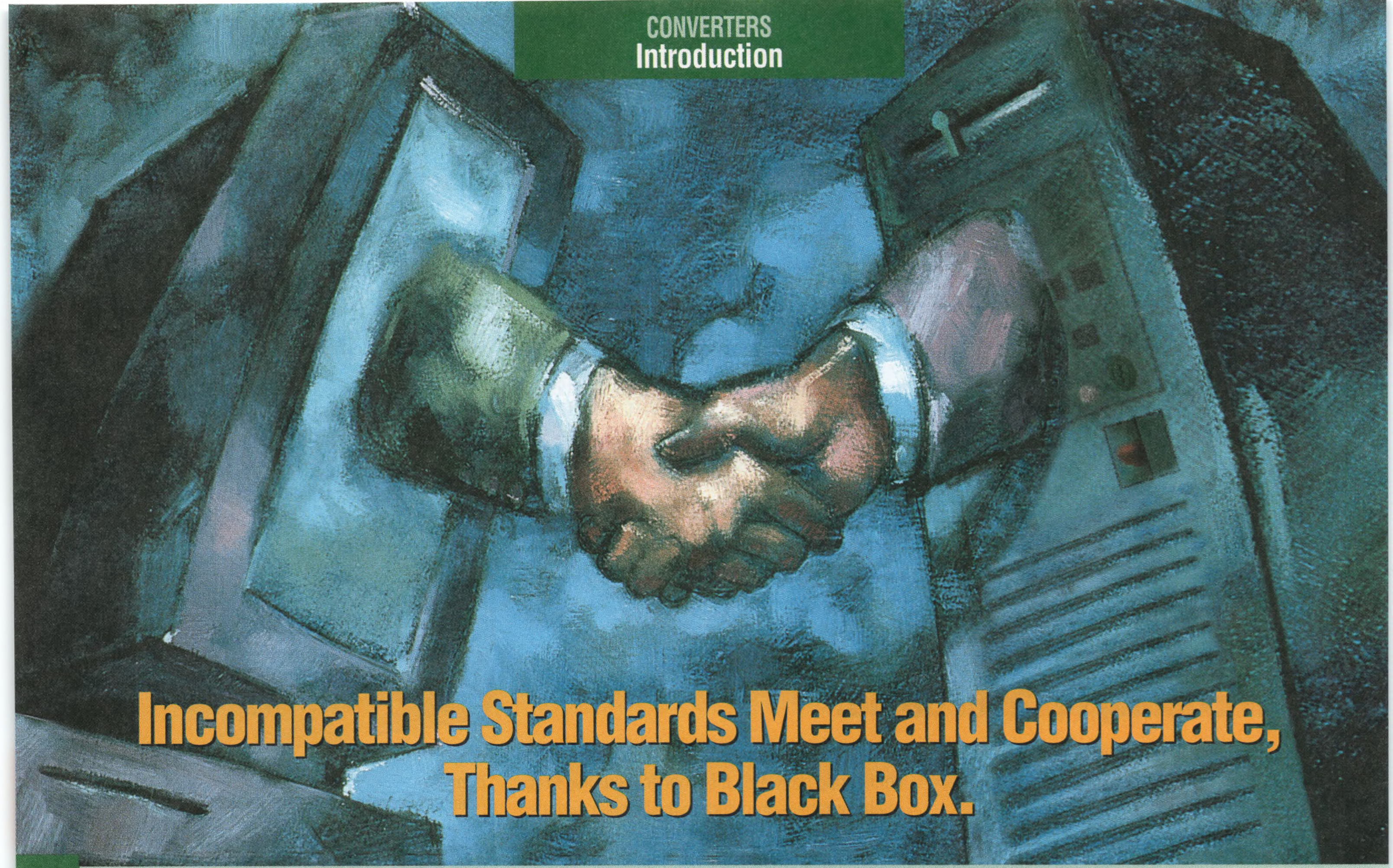
FAXBACK INFORMATION
Request Document Number: 11268
Call 412-746-5500 Anytime

Item		Code	Price
Serial Adapters			
PC	4-Wire	FA002	**$20.50**
	8-Wire	FA001	**$10.20**
AT®	4-Wire	FA003	**$20.50**
	8-Wire	FA004	**$10.20**
Modem	4-Wire	FA036	**$20.50**
	8-Wire	FA009	**$10.20**
Printer	4-Wire	FA047	**$20.50**
	8-Wire	FA046	**$10.20**

remember to order cables

RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.
Specify gender when ordering.



Incompatible Standards Meet and Cooperate, Thanks to Black Box.

Reconcilable Differences.

Different standards don't have to mean your equipment won't communicate—BLACK BOX® Interface Converters will crack the secret code for you. Soon your PC will speak to your current-loop equipment, your sync devices will cooperate with your async devices. Even recalcitrant MIL, RS-530, and RS-422 components will declare a truce and be on friendly terms with the rest of your computer world.

232
CURRENT LOOP

Let us do the negotiating for you—*any* interface difference can be reconciled with the help of BLACK BOX® Interface Converters (**pages 316–337**). We have more interface converters than anyone else!

So give us a call at **412-746-5500**. Your equipment can put aside their differences—and get to work.

How about a Boost?

If you have AS/400® or S/3X workstations, you want to boost your signal's strength and send it farther— and without noise.

You can shoot clear signals a long way—and do *even more*—with our twinax/UTP baluns, boosters, and repeaters (**pages 340–341**).

To add an explosive kick to your AS/400 or S/3X transmissions, use our boosters to send signals up to *4000 feet* over twisted pair.

If you want to fire noise-filtered signals *really* far—up to 8200 feet—check out our repeaters.

It's Time to Get SCSI.

Time was, the bus cabling limit of 20 feet made people skeptical about SCSI's usefulness.

So we *blew away* the old bus cabling limit.

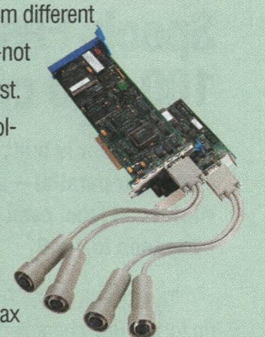
Now you can get a total bus length up to 79 feet away—or you can **dynamite** the cabling distance and run up to *3000 feet.*

While you're at it, consider adding SCSI peripherals to your PC, or turn your laptop's enhanced parallel port into a SCSI interface.

For more information, just turn to **pages 338–339**. . .and get SCSI.

Diplomatic Protocol.

Introducing devices from different platforms is no problem—not when you call Black Box first. With our full line of protocol-conversion components (**pages 342–357**), you can cross a wide variety of platforms—with ease.



We offer twinax and coax conversion, emulation cards, remote controllers and converters, and complete protocol conversion for midrange and mainframe computers.

BLACK BOX SOLUTIONS

Same-Day Shipping!

"We just bought a PC to replace our failed RS-485 controller. Then we realized that our new PC didn't connect to our RS-485 industrial lasers."

RS-422/485 Serial Interface Plus (IC050C)

Black Box saved the day!

Our Technical Support specialists quickly identified this customer's problem and shipped the proper converter right away—the RS-422/485 Serial Interface Plus (see **page 318**). This customer's industrial lasers were back in operation the very next day with minimal downtime, thanks to Black Box.

The RS-422/485 Serial Interface Plus is easy to install in your PC. You can connect your industrial RS-422 or RS-485 devices seamlessly—your PC thinks the converter is an RS-232 port, so no additional drivers are needed!

When you need the right solution and you need it right now, Black Box has your answer. You can even get the components you need overnight! **Just call: 412-746-5500.**

BLACK BOX SOLUTIONS

One-Stop Shopping!

"This bar-code reader supports no-parity serial connections but our computer only supports even-parity serial connections. Is there a way to make them work together?"

CAP
RESET
TXA RXA TXB RXB
PWR
BLACK BOX
*Communications Adapter Plus (CAP) (CMA02A), **page 336***

No problem! This is just the sort of job the Communications Adapter Plus (see **page 336**) was made for. With the CAP, you can match any two incompatible async serial devices just by setting simple DIP switches.

CAP converts word structure (number of data bits, parity, and stop bits), character sets (ASCII, EBCDIC, Baudot, transcode, and ticker tape), and flow control (DTR/CTS, X-ON/X-OFF, ENQ/ACK), bidirectionally between half- and full-duplex, and speeds from 45.5 bps to 38.4 Kbps.

When you need to connect the unconnectable, turn to Black Box for help. If you can't find the converter you need in this section, just call our technical support experts at **412-746-5500**.

FOR *FAST* TECH SUPPORT,
Call **412-746-5500**

PRESS **1,2,1** CONVERSION
Interface Converters, Twinax/UTP & Baluns, Protocol Converters, SCSI, Bar Code

Or if You Prefer:
Fax Us at: 412-746-0746.
E-mail Us at: info@blackbox.com

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MORE! Converters, see HOT NEW PRODUCTS

Make the Connection with Black Box.

Choosing the right PC Interface Card or Interface Converter…. Some other companies can make your purchasing decision an almost-agonizing process—but not Black Box! With this new guide, you can search our complete selection of PC Interface Cards and Interface Converters and find what you're looking for—fast *and* easy!

BUYER'S GUIDE

RS-232 SERIAL HOST ADAPTERS

				Interfaces					Speed	422/485			UART		IRQs			Connectors	
Item	**Page**	**Code**	**Price**	**RS-232**	**RS-422**	**RS-485**	**RS-530**	**Other**	**Kbps**	**4-Wire**	**2-Wire RTS**	**2-Wire Auto**	**Comm Chip**	**PC Bus**	**AT**	**Shared**	**Separate**	**Number of Ports**	**Cables Incl.**
Dual-Port	**318**	IC110C	**$174.00**	✔					115.2				16550	ISA	✔	✔	✔	(2) DB9 M	
RS-232 HS	**318**	IC130C	**$179.00**	✔					460.8				16650	ISA	✔	✔	✔	(2) DB9 M	
4-Port	**318**	IC111C	**$250.00**	✔					115.2				16550	ISA	✔	✔	✔	(4) DB25 M	✔
RS-232 HS4	**318**	IC131C	**$349.00**	✔					115.2				16650	ISA	✔	✔	✔	(4) DB25 M	✔
4-Port NT	**318**	IC102C	**$299.00**	✔					115.2				16550	ISA	✔	✔		(4) DB25 M	✔
8-Port	**318**	IC112C-R2	**$399.00**	✔					115.2				16550	ISA	✔	✔	✔	(8) DB25 M	✔
PC/422/485 Serial IC	**318**	IC030C-R2	**$195.00**		✔	✔			115.2	✔	✔		16550	ISA			✔	(1) DB25 M	
RS-422/485 Serial Interface Plus	**319**	IC050C	**$239.00**		✔	✔	✔		115.2 (EIA-530 pinout)	✔	✔	✔	16550	ISA	✔		✔	(1) DB25 M	
Single-Channel RS-232/530/422/485 20 mA Current-Loop Interface Conv.	**319**	IC601C	**$209.00**	✔	✔	✔	✔	20-mA Current Loop	232: 19.2 422/485/530: 115.2 Current Loop: 19.2	✔	✔		16550	ISA		✔	✔	(1) DB25 M	
RS-422/485 Serial Interface Plus, 2-Port	**318**	IC051C	**$279.00**		✔	✔			115.2	✔	✔	✔	16550	ISA	✔	✔	✔	(2) DB9 M	
w/Optical Isolation	**318**	IC057C	**$349.00**		✔	✔			115.2	✔	✔	✔	16550	ISA	✔	✔	✔	(2) DB9 M	
422/485 Serial IC Plus, 4-Port	**319**	IC058C	**$479.00**		✔	✔			460	✔	✔	✔	16750	ISA	✔	✔	✔	(4) DB9 M	
Dual-Port RS-232/422/485 Serial Comm Adapter	**318**	IC113C	**$237.00**	✔	✔	✔			115.2	✔	✔		16550	ISA	✔		✔	(2) DB9 M	
Dual-Port RS-422/485 Serial Interface	**319**	IC600C	**$219.00**		✔	✔			115.2	✔	✔		16550	ISA			✔	(2) DB9 M	
Single-Channel Parallel/ Serial I/O Interface	**3602**	IC602C	**$219.00**	✔	✔	✔	✔	Parallel	232/422/485: 115.2 40 Kcps Parallel	✔	✔			ISA	✔	✔		(1) DB9M DB25F	
Single-Channel Async MIL-188 Interface	**320**	IC603C	**$195.00**				✔	MIL-188	115.2					ISA	✔		✔	(1) DB25F	
RS-232 Interface	**317**	IC122C-R2	**$319.00**			✔			1.28 Mbps				85230-8					(2) DB25 M	
RS-530 Interface	**317**	IC120C-R2	**$339.00**				✔		1.28 Mbps				85230-8					(2) DB25 M	
V.35 Interface	**317**	IC121C-R2	**$379.00**	✔					1.28 Mbps				85230-8					(2) DB15 M	✔
RS-422/485 Adapter	**317**	IC114A	**$199.00**		✔	✔			115.2	✔	✔		16550	PCMCIA	✔		✔	(1) DB25 M	
RS-232 Adapter	**317**	IC115A	**$199.00**	✔					115.2	✔	✔		16550	PCMCIA	✔		✔	(1) DB25 M	
Dual Serial PC Card	**317**	IC118A	**$239.00**	✔					115.2	✔	✔		16550	PCMCIA	✔	✔		(2) DB9 M	

Black Box Explains…

IRQs, COM Ports, and Windows

Windows® 95 normally requires each serial port to have its own unique Interrupt Request Line (IRQ). However, if you use a third-party communications driver replacement that supports IRQ sharing, you can share interrupts. Unfortunately, data throughput will not be as high as with single interrupt port configurations.

With Windows NT™, you can share interrupts across multiple ports as long as the serial ports have an Interrupt Status Port (ISP) built onto the card.

The Interrupt Service Routine reads the ISP and is immmediately directed to the port that has an interrupt pending. Compared to the polling method used if the serial ports don't have an ISP, this feature can determine which port generated the interrupt up to four times more efficiently—and it almost eliminates the risk of lost data. Windows NT supports the ISP by enabling the user to configure the registry to match the card's settings. The IC102C and the IC112C both have IS ports and come with a Windows NT setup utility to simplify installation and configuration.

If your serial port doesn't have an ISP, the Interrupt Service Routine, a software routine that services interrupts and requests processor time, has to poll each port separately to determine which port generated the interrupt.

In This Section…
Interface
SCSI

PCMCIA Async or Sync Serial I/O Adapters

Give Yourself Extra Mobility with an Extra Comm Port.

BLACK BOX
(412) 746-5500
PCMCIA SERIAL
I/O ADAPTER
This Side
PCMCIA
232/422/
485

- **Control/automate RS-232 or RS-422/485 devices without being tied to your desk.**
- **RS-232 distances up to 50 feet (15.2 m); RS-422/485 to 4000 feet (1219 m).**
- **Sync data up to 200 Kbps; async up to 115.2 Kbps.**
- **DB25 male cable included.**

These Adapters give you an additional high-quality comm port. For complete compatibility, each one conforms to the PCMCIA Type II specification.

For interfacing to async bar coders, scales, or any RS-232 peripheral, use our async models. For protocols such as SDLC, HDLC, X.25, and for synchronous communications, choose our sync models. Async models include a utility disk for diagnostics, and sync versions include a utility disk and Developer's Tool Kit software.

The Dual Serial PC Card

This Card supports simultaneous connections to two super-fast serial devices for the price of just one Card! This Card has two 16550 UART chips with built-in buffers to eliminate the processing delays of slower serial ports. It supports all major Card and Socket Services software, too.

FAXBACK INFORMATION
Request Document Number: 12506
Call 412-746-5500 Anytime

PLUS! Serial Host Adapters, **see p. 318.**

SPECIFICATIONS

Communication Chip — IC114A–IC115A: 16550 UART;
IC116A–IC117A: Zilog™ 85233 SCC (serial communication controller)

Protocol — IC114A–IC115A: Asynchronous;
IC116A–IC117A: Synchronous

System Requirements — PC, notebook, or laptop with a PCMCIA Type II slot, and a 3.5-in. floppy drive

Speed — IC114A–IC115A: Up to 115.2 Kbps;
IC116A–IC117A: Up to 200 Kbps

CE Approval — All items listed are approved

Connectors — Interface cable (included): DB25 male; to (PCMCIA Type II) dangle

Size — PCMCIA Type II

Weight — < 1 lb. (< 0.5 kg)

Item	**Code**	**Price**
PCMCIA Async or Sync Serial I/O Adapters, Single Port		
Async		
RS-422/485	IC114A	**$199.00**
RS-232	IC115A	**$199.00**
Sync		
RS-422/485	IC116A	**$339.00**
RS-232	IC117A	**$339.00**
Dual Serial PC Card	IC118A	**$239.00**

remember to order cables ***Different applications require different cables. Call Tech Support to be sure you order the right one.***

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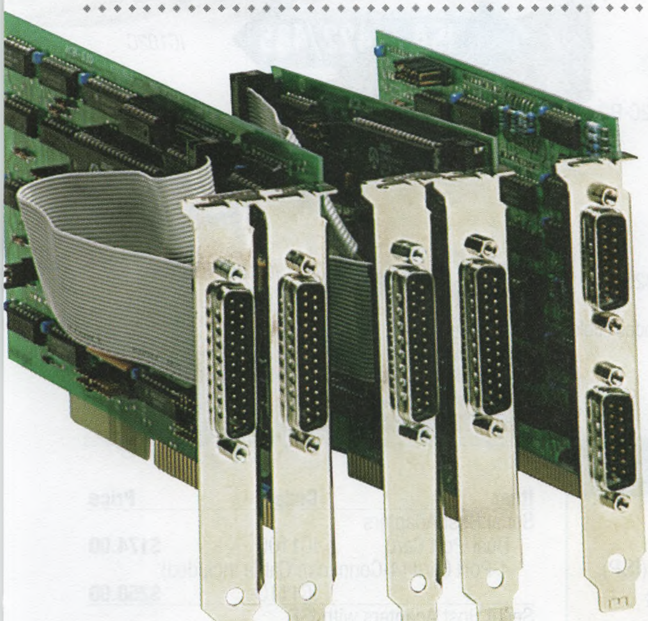


Dual-Channel High-Speed Sync/Async Adapters

Speed Up Serial Data Rates!

- **Dual-channel sync/async with full-duplex dual DMA (Direct Memory Access) transfer on both channels.**
- **Software-programmable speeds.**
- **Includes Developer's Tool Kit with software examples and source code.**

If you need higher speeds for your serial communications, here's your answer. These new Adapters provide your PC with two direct high-speed sync/async links to devices requiring fast data flow—the DMA supports speeds up to 1.28 Mbps. The Adapters feature two channels of sync/async communications using the 85230 serial communications controller (SCC). And the Adapters support HDLC, SDLC, ISDN LapD, bisync, and hybrid DLC protocols. Choose from three models: RS-232, RS-530, and V.35 interfaces.

ISA 232/530/V.35

FAXBACK INFORMATION
Request Document Number: 13040
Call 412-746-5500 Anytime

SPECIFICATIONS

Speed — Up to 1.28 Mbps

CE Approval — All items listed are approved

Interface — IC122C-R2: RS-232;
IC120C-R2: RS-530, RS-422, and RS-485;
IC121C-R2: V.35

Connectors — IC122C-R2, IC120C-R2: (2) DB25M;
IC121C-R2: (2) DB15M (V.35 Adapter Cable included)

Power — From PC

Size — PC ISA ¾ Card

Weight — 1 lb. (0.5 kg)

Item	**Code**	**Price**
Dual-Channel High-Speed Sync/Async Adapters		
RS-232	IC122C-R2	**$319.00**
RS-530	IC120C-R2	**$339.00**
V.35	IC121C-R2	**$379.00**

remember to order cables ***Different applications require different cables. Call Tech Support to be sure you order the right one.***

RS-232 HS Adapter

PC
232
Aitron
Aitron

Eliminate the Bottleneck in Your PC with RS-232 HS Adapters.

- **16650 UART chip for high speed.**
- **Choose from eight interrupt selections for easy integration.**
- **Compatible with DOS, Windows® 3.1x, Windows 95, Windows NT™, and other operating systems.**

FAXBACK INFORMATION
Request Document Number: 17398
Call 412-746-5500 Anytime

Many older PCs don't have a port that can take full advantage of today's high-speed modems—so you don't get a high-speed connection. But with the BLACK BOX® RS-232 HS Adapter, which features a 16650 UART chip, you can use your high-speed devices to their fullest potential.

An enhanced 32-byte buffer eliminates the bottleneck that can slow your system. And the Adapter features programmable baud rate, data format, and interrupt control.

SPECIFICATIONS

Communications Chip — 16650 UART
Diagnostics — 3.5-inch asynchronous utility-disk
MTBF — >150,000 hours
CE Approval — All items listed are approved
Connectors — (2) DB9 M, (1) PC-card edge, 16-bit
Power — + 12 VDC at 50 mA, -12 VDC at mA, +5 VDC at 195 mA

Item	Code	Price
RS-232 HS Adapter	IC130C	**$179.00**

remember to order **cables** *Different applications require different cables. Call Tech Support to be sure you order the right one.*

Black Box Explains...

Ultra High-Speed RS-232.

In theory, standard RS-232 ports are capable of data rates up to 115.2 Kbps. But computers don't really operate that way. Instead of 115.2 Kbps, you often get a data rate closer to 56 Kbps because the older hardware isn't equipped for high-speed applications.

The standard 16650 chip provides surplus memory in the buffer, which helps your applications overcome the factors that slow down your system.

The 16650 UART chip also gives you an *enhanced* 32-byte buffer so the processor can service *twice* the normal amount of data going in and out of your computer. And with a throughput of up to 460.8 Kbps, the RS-232 is the *fastest* COM port in the industry.

* * *

Serial Host Adapters

Add up to Eight Serial Ports to Your PC!

- **Add ports and conserve slots—perfect for loaded systems.**
- **Choose from up to 11 interrupts.**

Add up to eight extra serial ports to your PC with just one RS-232 Interface Card—and *select from up to 11 available interrupts!*

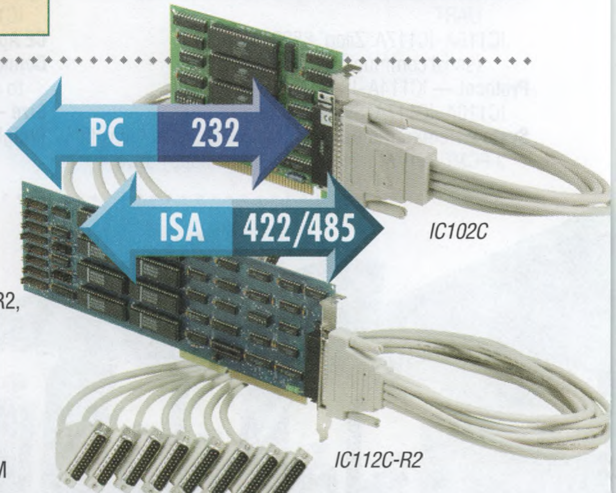
IC102C and IC112C-R2 feature a built-in Interrupt Status Port (ISP)so multiple ports and multiple cards can share a single IRQ.

The Dual Port RS-232/422/485 Serial Comm Adapter enables you to run RS-232, RS-422, or RS-485 devices.

The new IC131C features a 16650 UART chip with a 32-byte FIFO buffer for faster data handling.

SPECIFICATIONS

Communications Chip — IC102C, IC110C–IC111C, IC112C-R2, IC113C: 16550 UART; IC131C: 16650 UART
Operation — IC102C, IC110C–IC111C, IC112C-R2, IC131C: RS-232; IC113C: RS-485/422, 2- or 4-wire
Protocol — Asynchronous
Speed — Up to 115.2 Kbps
CE Approval — All items listed are approved
Connectors — IC110C: (2) DB9M; IC102C, IC111C, IC131C: (1) DB37, (4) DB25M on included cable; IC112C-R2: (1) DB78HD, (8) DB25M on included cable; IC113C: (2) DB9M
Power — From PC Bus



IC102C

IC112C-R2

FAXBACK INFORMATION
Request Document Number: 16933
Call 412-746-5500 Anytime

Item	Code	Price
Serial Host Adapters		
Dual-Port Card	IC110C	**$174.00**
4-Port Card (4-Connector Cable Included)	IC111C	**$250.00**
Serial Host Adapters with ISP		
4-Port Card (4-Connector Cable Included)	IC102C	**$299.00**
8-Port Card (8-Connector Cable Included)	IC112C-R2	**$399.00**
RS-232/422/485 Serial Comm Adapter		
Dual-Port Card	IC113C	**$237.00**
New RS-232 HS4	IC131C	**$349.00**

remember to order **cables** *Different applications require different cables. Call Tech Support to be sure you order the right one.*

Black Box Explains...

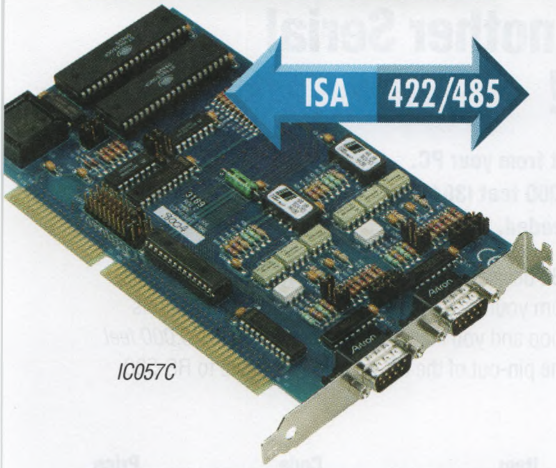
Windows NT IRQ Sharing.

Typically, protected-mode operating systems such as Windows® have required each serial port to have its own unique Interrupt Request Line (IRQ). This is especially true for Windows 3.x and Windows 95. The only way to share interrupts under Windows 3.x or Windows 95 without risking data loss is to install a replacement communications driver.

With the arrival of Windows NT™, interrupt sharing is possible "right out of the box." But in order to share interrupts, the serial-port card must have a built-in Interrupt Status Port (ISP). If you don't have an ISP, the software that services the interrupts and requests processor time (or Interrupt Service Routine) has to poll each port separately to determine which port generated the interrupt. Polling each port separately is inefficient and risks data loss.

However, if your serial-port card does have an ISP, the interrupt service routine reads the Interrupt Status Port and is immediately directed to the correct port.

RS-422/485 Serial Interface Plus



IC057C

FAXBACK INFORMATION
Request Document Number: 14144
Call 412-746-5500 Anytime

Support RS-422/485 from Your PC.

- **Connect up to 32 peripherals under DOS, OS/2, or Windows in your 485 network.**
- **COM-1 through COM-4 addressable.**
- **Supports speeds up to 115.2 Kbps.**
- **Controls the RS-485 driver-enable signal automatically.**
- **Choose from 10 IRQ selections.**

Link a PC running Windows®, DOS, or OS/2® to your industrial RS-422/485 hardware. Attach your PC to 31 other devices up to 4000 feet (1219.2 m) away on the shop floor. Your PC reads the Interface Card as an RS-232 port, eliminating all communications roadblocks and incompatibility lockups.

Use the optical isolation version to protect communications devices connected to your PC from spikes, surges, and ground differences.

SPECIFICATIONS

Communication Chip — 16550 UART
Isolation — IC057C: 500 V DC Isolation
Maximum Distance — 4000 ft. (1219.2 m)
Memory — 16550 buffered UART
Operation — 2- or 4-Wire
Protocol — Asynchronous
Speed — Up to 115.2 Kbps
CE Approval — All items listed are approved
Connectors — IC050C: (1) DB25 (EIA-530 pinout); IC051C, IC057C: (2) DB9
Power — From PC Bus
Size — Half-card

Item	Code	Price
RS-422/485 Serial Interface Plus		
1-Port	IC050C	$239.00
2-Port	IC051C	$279.00
2-Port (with Optical Isolation)	IC057C	$349.00
RS-530 Data Cable 10-ft. (3.0-m) Male/Male	EVN530-0010-MM	$41.95

remember to order cables

For other lengths and genders, see p. 88.

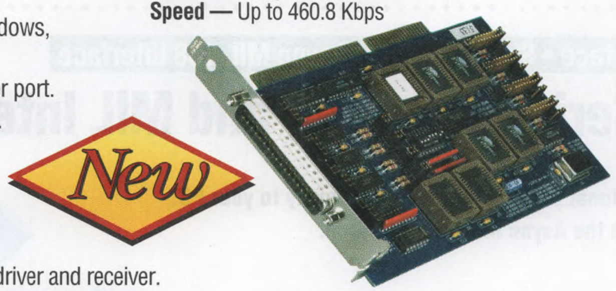
RS-422/485 Serial Interface Plus, 4-Port

Control RS-485 Devices from Windows.

- No special drivers required.
- Compatible with all versions of Windows, including Windows NT.
- Control up to 31 RS-485 devices per port.
- Supports both RS-485 and RS-422.
- Speeds up to 460.8 Kbps.
- Distances up to 4000 ft.
- Nine IRQ settings to choose from.
- Extra-large 64K buffer.
- Automatically enables and disables driver and receiver.

SPECIFICATIONS

Communication Chip — 16750 UART
Maximum Distance — 4000 ft. (1219.2 m)
Operation — 2- or 4-Wire
Protocol — Asynchronous
Speed — Up to 460.8 Kbps
CE Approval — All items listed are approved
Connectors — (1) DB37M, (4) DB9M on included cable
Power — From PC Bus
Size — ¾ card



Item	Code	Price
RS-422/485 Serial Interface Plus, 4-Port	IC058C	$479.00
Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight Pinned	EYN737MS-0010	$10.95
Modular Thumbscrew Adapter Kit, DB9F↔RJ-45F (8-wire)	FA756	$9.95

remember to order cables

For other lengths and pinnings, see p. 68.

RS-422/485 Serial Interface Converters

Link Up to 64 Devices to Your PC—and Eliminate Line Noise, Too!

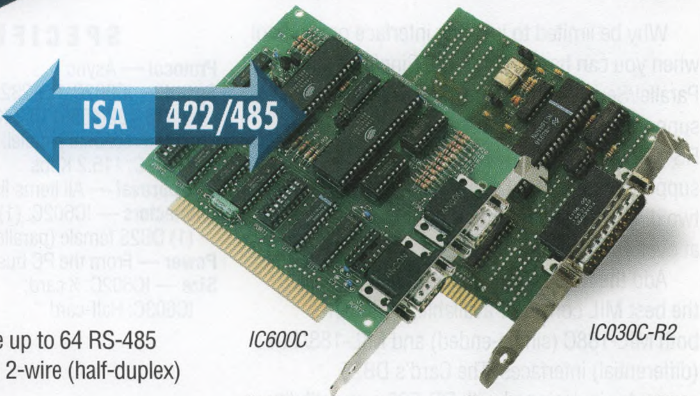
- **No additional line drivers or converters are needed.**
- **Link bar-code readers, time clocks, scales—even interface-to-factory automation equipment.**

Connect twice as many RS-422 and RS-485 devices to your PC—or interface up to 64 RS-485 devices—with this Dual-Port Converter. It supports both 4-wire (full-duplex) and 2-wire (half-duplex) operations, and the driver can be enabled permanently or with RTS.

The Dual-Port Converter also eliminates disruptive line noise. Its RS-422 and RS-485 interfaces measure the difference in electrical signals and keep this difference constant. Line noise is eliminated and your data integrity is maintained.

To link up to 32 devices, choose our PC↔422/485 Serial Interface Converter.

FAXBACK INFORMATION
Request Document Number: 15798
Call 412-746-5500 Anytime



IC600C IC030C-R2

SPECIFICATIONS

Protocol — Async
Speed — Up to 115.2 Kbps; maximum data rate depends on software, CPU, and cable length
System Requirements — ISA bus
CE Approval — All items listed are approved
Connectors — IC600C: (2) DB9 male; IC030C-R2: (1) DB25 male
Power — From the PC bus

Item	Code	Price
Dual-Port RS-422/485 Serial Interface	IC600C	$219.00
PC↔422/485 Serial Interface Converter	IC030C-R2	$195.00
Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight Pinned	EYN737MS-0010	$10.95

remember to order cables

For other lengths and pinnings, see p. 68.

Item	Code	Price
Modular Thumbscrew Adapter Kits		
For IC600C:		
DB9F↔RJ-45F (8-Wire)	FA756	$9.95
For IC030C-R2:		
DB25F↔RJ-45F (8-Wire)	FA771	$9.95

ISA
232/422/485/20 mA

It's all in the Card: the flexibility of adding one of four interfaces to your PC, the ability to address up to 32 RS-485 devices, and the power to increase data distances up to 10,000 feet (3048 m).

FAXBACK INFORMATION
Request Document Number: 15808
Call 412-746-5500 Anytime

Single-Channel RS-232/530/422/485/20-mA Current-Loop Interface

Add Flexibility and Another Serial Interface to Your PC!

- **Directly address up to 32 RS-485 devices right from your PC.**
- **Stretch your communications range up to 10,000 feet (3048 m)!**
- **No additional line drivers or converters are needed.**

For basic connections, use the Card to link RS-232 devices up to 50 feet (15.2 m) away. Or use its RS-422/485 interface to address up to *32* devices from your PC—and stretch your communications up to 5000 feet (1524 m)! Choose 20-mA Current Loop and you increase the distance up to *10,000 feet (3048 m)!* Using just a standard cable connection, the pin-out of the RS-422/485 interface to RS-530 specifications. Call Tech Support for more details.

SPECIFICATIONS

Protocol — Async
Speed — RS-232: 19.2 Kbps;
RS-422/485: 115.2 Kbps;
20 mA Current Loop: 19.2 Kbps
System Requirements — ISA bus
CE Approval — Yes
Connectors — (1) DB25 male
Power — From the PC bus

Item	Code	Price
Single-Channel RS-232/530/422/485/20-mA Current-Loop Interface	IC601C	**$209.00**

remember to order cables *Different applications require different cables. For more information, call Tech Support.*

◆ ◆ ◆

Single-Channel Parallel/Serial I/O Interface • Single-Channel Async MIL-188 Interface

Versatile Cards for Serial, Parallel, and MIL Interfaces.

- **I/O Interface adds a serial port *and* a bidirectional parallel port simultaneously to your PC.**
- **Easily connect MIL equipment to your PC with the Async MIL-188 Interface.**

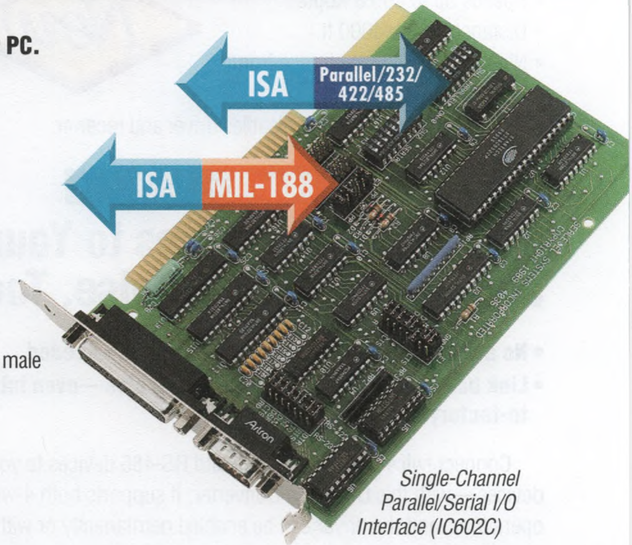
Why be limited to just one interface or protocol when you can have many? The Single-Channel Parallel/Serial I/O Interface gives you serial support for a variety of interfaces—RS-232, RS-422, and RS-485. And its parallel port supports bidirectional operations. Send data in two directions—and double your throughput—at over 400 Kbps!

Add the MIL-188 to your PC and you have the best MIL converter available. It supports both MIL-188C (single-ended) and MIL-188/114 (differential) interfaces. The Card's DB25 connector is designed with RS-530 compatibility.

FAXBACK INFORMATION
For Parallel/Serial I/O Interface: 15815,
For Async MIL-188 Interface: 15822,
Call 412-746-5500 Anytime

SPECIFICATIONS

Protocol — Async
Speed — IC602C: RS-232: 19.2 Kbps;
RS-422/485: 115.2 Kbps;
Bidirectional parallel: 400+ Kbps;
IC603C: 115.2 Kbps
CE Approval — All items listed are approved
Connectors — IC602C: (1) DB9 male (serial),
(1) DB25 female (parallel); IC603C: (1) DB25 male
Power — From the PC bus
Size — IC602C: ¾ card;
IC603C: Half-card



Single-Channel Parallel/Serial I/O Interface (IC602C)

Item	Code	Price
Single-Channel Parallel/Serial I/O Interface	IC602C	**$219.00**
Single-Channel Async MIL-188 Interface	IC603C	**$195.00**

remember to order cables ***For IC602C parallel connections, order:***

Parallel Printer Cable, 10-ft. (3.0-m) Male/Male
EYN600-0010-MM **$16.95**
For other lengths and genders, see p. 106.

For IC602 RS-232 connections, order:

AT® Premium Modem Cable, 10-ft. (3.0-m)
EVMBMC-0010 **$19.95**
For other lengths, see p. 109.

For IC603 connections, order:

Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight Pinned
EYN737MS-0010 **$10.95**
For other lengths and pinnings, see p. 68.

DB9↔MMJ Adapter Kit, Male
FA765 **$12.95**

In This Section...
Interface
SCSI

More Interface Converters than You'll Find *Anywhere* Else. Only at Black Box.

We have Your Interface Converter!

Black Box has the interface converters you just won't find anywhere else. Converters for industrial interfaces such as Current Loop. Converters for G.703 and X.21 interfaces, which are primarily used overseas. Even the near impossible-to-find MIL Converter.

Check out our serial converters in the chart **below**. And see **pages 333–335** for interface converters for Macintosh®, BCD, ASCII, DTMF, and more.

Whatever interface converter you need to make the most of your system, chances are you can find it right here.

Even X.21!
XIC

*See our X.21 Interface Converters on **page 327**.*

SERIAL INTERFACE CONVERTERS

Conversion		Power Source			Protocol		Page(s)
Interface A	**Interface B**	**AC**	**Rack**	**Interface**	**Async**	**Sync**	
232	422/485	✔	✔		✔		322, 324–325
				✔	✔		329, 330–331
	422/485/449	✔	✔			✔	324
	422/449			✔		✔	329, 331
	V.35	✔	✔			✔	326
				✔		✔	329
	530	✔	✔		✔	✔	324
	X.21	✔	✔			✔	327
				✔		✔	327
	MIL-188/114	✔	✔		✔	✔	325
	Current Loop	✔	✔		✔		332–333
				✔	✔		332–333
	IEEE-488, HPIB/GPIB	✔			✔		334
	TTL			✔	✔		333
	TDI	✔			✔		325
232/422/485/CL	Fiber Optic	✔			✔		323
V.35	422/449/530	✔	✔			✔	326
	422/449/530			✔		✔	329, 331
	X.21	✔	✔			✔	326
449	X.21			✔		✔	324, 327, 331
G.703	V.35/X.21/449/530	✔				✔	327

Why an Interface Converter from Black Box?

Sure, you could buy an interface converter from just anyone. But chances are, you'll find your best deal with a BLACK BOX® Converter. Here's why:

- **Black Box stocks the world's *largest* selection of Interface Converters.**
- ***Expert* technicians are available to help you select the right converter.**
- **Same-day shipping. Right up to *midnight* ET.**
- **Free expert 24-hour technical support—our Techs answer your call in 3 to 5 rings, *every* day.**
- **45-day money-back guarantee—no questions asked.**

Just one phone call to Black Box does it all!

TECH SUPPORT'S PRODUCT OF CHOICE
232 ↔ 485/422
OPTO-ISOLATOR/CONVERTER
NORMAL
DLB
DCE
DTE
RX TX RTS CD
TX RX CD RTS
PWR
BLACK BOX

*The popular BLACK BOX® RS-232↔485/422 Converter Plus on **page 322** features echo suppression, speeds up to 115.2 Kbps, and optional optical isolation.*

RS-232↔RS-485/422 Converter Plus • Converter Plus with Opto-Isolation

Our Top-Selling Converter Is Now Twice as Fast! Transmits Data up to 115.2 Kbps.

- **Transmit data at distances up to 4 miles.**
- **Operates in multipoint applications.**
- **2- or 4-wire operation.**
- **Speeds up to 115.2 Kbps.**
- **Auto-transmitter enable at baud rates up to 64 Kbps.**
- **Selectable half-duplex turnaround delay.**
- **Selectable RTS-CTS turnaround delay.**
- **Echo suppression.**
- **Bias enable.**
- **Terminate/Unterminate option.**
- **Externally selectable loopback test feature.**
- **Rackmount and optical-isolation options.**

FAXBACK INFORMATION
Request Document Number: 13033
Call 412-746-5500 Anytime

SPECIFICATIONS

Operation — 4-wire half- or full-duplex, 2-wire half-duplex
CE Approval — All items listed are approved
Connectors — (1) DB25 female; (1) 4-screw terminal
Power — 115 VAC, 60 Hz or 230 VAC, 50 Hz
Size — Standalone: 1.8"H x 5.5"W x 8.4"D (4.6 x 14 x 21.3 cm); Card: 4.7"H x 0.6"W x 7.4"D (11.9 x 1.6 x 18.8 cm)

115 Kbps!

We doubled the speed of our top-selling Converter to keep up with today's fastest PCs. So if your PC has a 16550 UART chip, you can send data at 115.2 Kbps! The RS-232↔485/422 Converter Plus has a line bias feature that prevents it from receiving line noise as Send or Receive signals. Works in all popular 2- or 4-wire applications, too.

115 Kbps *plus* Opto-Isolation!

Protect one segment on your extended network from problems on another segment. This unit is functionally identical to the BLACK BOX® RS-232↔485/422 Converter Plus, *plus* it's equipped with built-in opto isolators.

Item	Code	Price
RS-232↔485/422 Converter Plus		
Standalone	IC108A	**$259.00**
Rackmount Card	IC108C	**$224.00**
RS-232↔485/422 Converter Plus w/Opto-Isolation		
Standalone	IC109A	**$289.00**
Rackmount Card	IC109C	**$259.00**
You may need...		
Rack Nest 400 (**p. 326**)	RM700A	**$700.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

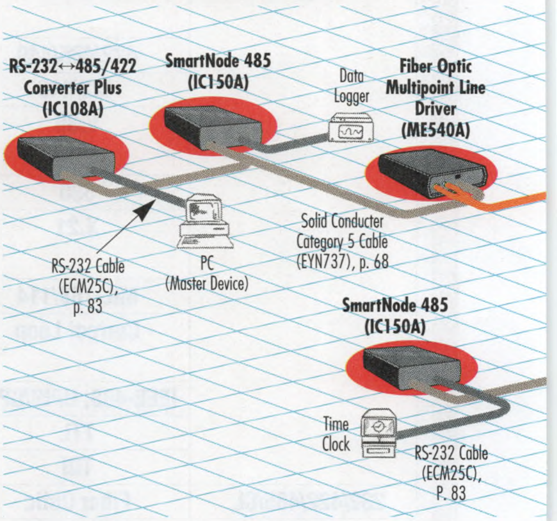
For other lengths, see p. 83.
Specify gender when ordering.

232
422/485
232 ↔ 485/422 OPTO-ISOLATOR / CONVERTER
232 ↔ 485/422 CONVERTER PLUS
NORMAL
DLB
DCE
DTE
RX TX RTS CD
TX RX CD RTS
PWR
BLACK BOX
TECH SUPPORT'S PRODUCT OF CHOICE

IC108A

IC109A

PLUS! For RS-485 Sync operations, see the IC485A-R2 on **p. 324.**


RS-232↔485/422 Converter Plus (IC108A)
SmartNode 485 (IC150A)
Data Logger
Fiber Optic Multipoint Line Driver (ME540A)
RS-232 Cable (ECM25C), p. 83
PC (Master Device)
Solid Conducter Category 5 Cable (EYN737), p. 68
SmartNode 485 (IC150A)
Time Clock
RS-232 Cable (ECM25C), P. 83

SmartNode 485

All the Benefits of Multidrop RS-485 with RS-232 Devices.

- **Build your own RS-485 industrial LAN with your RS-232 equipment.**
- **8-KB buffer means no loss of data.**
- **Address each RS-232 device as an intelligent RS-485 peripheral.**

The SmartNode 485 responds to address polls, holds information until Send time, and even converts data rates and word structures. Each port can be set for different word speeds and word structures. Two-wire RS-485 support is included with the product.

To use other RS-485 equipment with SmartNode and to add serial interface capabilities to your PC, try our RS-422/485 Serial Interface Plus (IC050C) on (**page 319**). It turns your PC into the master on a SmartNode network without adding an external converter. For external conversion, use the IC108A or IC109A, **above**. Or if you're at your distance limit, then you need the RS-485 Repeaters, on (**page 323**).

SPECIFICATIONS

Leads Supported — RS-232: DTR, DSR, CD, TD, RD, RTS, CTS, GND; RS-485: T+, T-, R+, R-
Operation — RS-232: Half- or full-duplex; RS-485: 4-wire half- or full-duplex, 2-wire half-duplex
Protocol — Async only
Speed — 45.5 bps to 38.4 Kbps
CE Approval — All items listed are approved
Interface — RS-232 DTE, RS-485
Connectors — (1) DB9 female, (1) 4-position terminal block
Power — 115 VAC, 60 Hz (230-VAC, 50-Hz version on request)
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)
Weight — 2 lb. (0.9 kg)

FAXBACK INFORMATION
Request Document Number: 10133
Call 412-746-5500 Anytime

232
485/449
SMART NODE - 485
485
232
RESET
TD RD TD RD
PWR
BLACK BOX

Item	Code	Price
SmartNode 485		
Standalone	IC150A	**$295.00**
Card	IC150C	**$255.00**
12-Card Rack for SmartNode	RM010-SN	**$330.00**
remember to order cables 9-Pin to DTE Cable (DB25 Male)	EHM023-0010	**$21.05**
9-Pin to Modem Cable (DB25 Male)	EHM024-0010	**$21.05**
9-Pin to AT® Cable (DB9 Female)	EHM025-0010	**$18.30**
9-Pin to PC Cable (DB25 Female)	EHM026-0010	**$21.05**

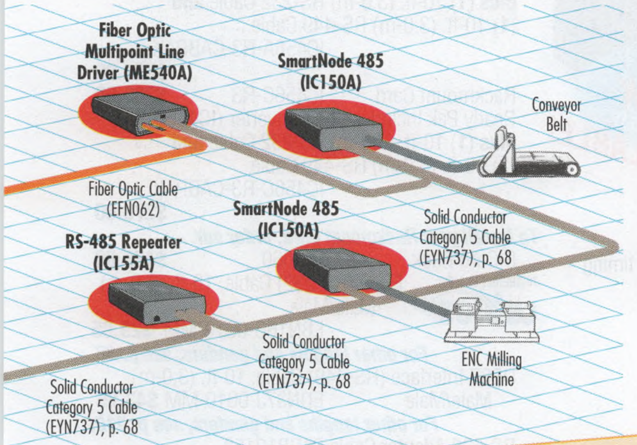
Fiber Optic Multipoint Line Driver

Run Multipoint through Industrial Settings.

232
485
20mA
NETWORK
MASTER
SLAVE
TXD
RXD
TXD
RXD
INTERFACE
MODE
PORT B
PORT A
FOM LINE DRIVER
NORMAL
DLB
BLACK BOX

- **Supports RS-232, RS-485, or current-loop installations.**
- **Speeds as high as 128 Kbps.**
- **Ideal for electrically "noisy" industrial applications.**
- **Provides centralized control of a multipoint polled system from just one PC.**

Fiberoptic cable is immune to the EMI and RFI generated by heavy-duty motors and industrial machinery. And that's why this Multipoint Line Driver is the *perfect choice* for data communications in even the harshest industrial settings.


Fiber Optic Multipoint Line Driver (ME540A)
SmartNode 485 (IC150A)
Conveyor Belt
Fiber Optic Cable (EFN062)
SmartNode 485 (IC150A)
RS-485 Repeater (IC155A)
Solid Conductor Category 5 Cable (EYN737), p. 68
Solid Conductor Category 5 Cable (EYN737), p. 68
ENC Milling Machine
Solid Conductor Category 5 Cable (EYN737), p. 68

Connect RS-232, RS-485, or current-loop devices with the BLACK BOX® Fiber Optic Multipoint Line Driver. Then you can monitor and control any number of industrial devices—time clocks, conveyor belts, printers and controllers—from one central site. Using the inherent benefits of fiberoptic cable, you can completely automate your factory operations—just call Black Box!

You'll enjoy increased data speeds, too—up to 20 Kbps for current-loop data, 64 Kbps for RS-232, and 128 Kbps for RS-485 data. And, of course, fiberoptic cable eliminates the threat of power surges and the need for surge-protection equipment.

> ***"Your Fiber Line Drivers were the cost-effective way to extend the RS-485 communications of our plant."***

SPECIFICATIONS

Maximum Distance — 5000 ft.
Operation — Network Mode or Master/Slave Mode, multipoint half-duplex, point-to-point line driver operation, full-duplex
Speed — Transparent through 128 Kbps
CE Approval — All items listed are approved
Interface — RS-232 DCE/DTE, RS-485, 20-mA current loop (Transmit and Receive can be active or passive), fiberoptic
Connectors — (1) DB9, (4) ST or SMA, (1) 4-screw terminal block
Power — 115 VAC, 60 Hz, external
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)
Weight — 2 lb. (0.9 kg)

NOTE: Must be used in pairs.

Item	Code	Price
Fiber Optic Multipoint Line Driver		
ST	ME540A-ST	**$385.00**
SMA	ME540A-SM	**$385.00**
remember to order cables Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
For specific lengths or bulk cable, see pp. 74 and 118.		
ED/Q Thumbscrew Cable with Nonremovable EMI/RFI Hoods, (DB9,NEC® CL2)		
10-ft. (3.0-m)	EGM12D-0010	**$22.45**
For other lengths, see p. 86		

RS-485 Repeater

Extend Your RS-485 Network beyond 4000 Feet—and Add up to 30 More Devices.

- **Crystal-clear controller signal out to 4000 feet.**
- **Opto-isolation available.**

Your RS-485 devices or segments can reach well beyond their normal distance limit with the BLACK BOX® RS-485 Repeater. We also have the Opto-Isolated Repeater (IC158A) to protect your lines from ground loops and other electrical problems.

SPECIFICATIONS

Flow Control — Transparent
Leads Supported — Both ports: TDA, TDB, RDA, RDB
Operation — Half- or full-duplex
Speed — Transparent up to 128 Kbps
CE Approval — All items listed are approved
Connectors — (2) 4-wire terminal blocks, (2) RJ-45
Indicators — Power, Carrier Detect (both ports)
Power — 115 VAC, 60 Hz (230-VAC version on request)
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)

RS485 REPEATER
PWR
CDB
CDA
BLACK BOX

Item	Code	Price
RS-485 Repeater	IC155A	**$150.00**
RS-485 Repeater (Opto-Isolated)	IC158A	**$255.00**
remember to order cables Category 5 Solid Conductor Cable, 2-Pair, Bulk, PVC	EYN717A	**$.15/ft.**
For plenum applications, see p. 115.		

Twinax/ UTP & Baluns
Protocol

FAXBACK INFORMATION
Request Document Number: 10212
Call 412-746-5500 Anytime

RS-232↔RS-422 Converter

Simple RS-232↔ RS-422 Conversion.

- **Our basic 64-Kbps converter.**
- **Transmit data up to 4000 ft.**
- **Full-duplex operation over 4-wire lines.**
- **In RS-485 mode, select either RTS or DTR to enable the driver.**
- **Async only.**
- **To support handshake and clocking leads, see the RS-232↔RS-422/RS-449 Converter below.**

The Ready Pak includes a 10-ft. EDQ Shielded RS-232 Cable with two DB25 male connectors (EBN07C-0010-MM).

232
422
232 ↔ 422/485 CONVERTER
DATA ONLY
BLACK BOX
RX TX
CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!

SPECIFICATIONS

Distance — Up to 4000 ft. (1219 m)
Operation — 4-wire, full-duplex only
Speed — Up to 64 Kbps
CE Approval — 230-VAC version: IC107AE-R2
Connectors — (1) DB25 female, (1) 4-screw terminal
Power — 115 VAC, 60 Hz (230-VAC, 50-Hz version on request)
Size — 1.8"H x 5.5"W x 8.4"D (4.6 x 14 x 21.3 cm)

Item	Code	Price
RS-232↔RS-422 Converter		
Standalone	IC107A-R2	**$213.00**
Rackmount Card	IC107C-R2	**$178.00**
The Ready Pak Includes: the Standalone Converter **plus** (1) EDQ Shielded RS-232 Cable	IC107A-R2-CABPAK	**$236.95**
To connect your Converter's 485 port, you may need...		
Rack Nest 400	RM700A	**$700.00**
remember to order cables Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		

RS-232↔RS-422/RS-449 Converter

Sync or Async RS-422 Conversion.

- **Full RS-422 data conversion: data handshaking and clock signal.**
- **Speeds up to 64 Kbps.**
- **Converts bidirectionally.**
- **Sync or Async.**
- **Configuring is as simple as moving a jumper.**

Both the Standalone and the Rackmount Converter are also available in a Ready Pak that includes the converter, an RS-232 cable (EBN16C-0010-MM) with two male DB25 connectors, and an RS-449 cable (EDN37J-0010-MM) with two male DB37 connectors.

232
422/449
(J2) RS-232
(J1) RS-422
CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!

SPECIFICATIONS

Signals Supported — All data, handshake, and timing
CE Approval — 230-VAC version: IC456AE-R3
Connectors — RS-232: DB25 female; RS-422: DB37 female
Power — Standalone: 115 VAC, 60 Hz; Rackmount: 11.9 watts
Size — Standalone: 2.3"H x 8"W x 11.9"D (5.8 x 20.3 x 30.2 cm); Rackmount: 1.2"H x 7.5"W x 11.4"D (3 x 19.1 x 29 cm)
Weight — Standalone: 2 lb. (0.9 kg); Rackmount: 0.6 lb. (0.3 kg)

Item	Code	Price
RS-232↔RS-422/449 Interface Converter		
Standalone	IC456A-R3	**$259.00**
Ready Pak Includes: the Converter (IC456A-R3) **plus** (**1**) 10-ft. (3.0-m) RS-232 Cable **and** (**1**) 10-ft. (3.0-m) RS-449 Cable	IC456A-R3-CABPAK	**$332.90**
Rackmount Card	IC456C-R3	**$200.00**
Ready Pak Includes: the Converter (IC456C-R3) **plus** (**1**) 10-ft. (3.0-m) RS-232 Cable **and** (**1**) 10-ft. (3.0-m) RS-449 Cable	IC456C-R3-CABPAK	**$273.90**
To install your Rackmount Card, order our...		
8-Card Rack	RM060	**$425.00**
remember to order cables ED/Q (RS-232) Cable, 10-ft. (3.0-m) Male/Male	EBN16C-0010-MM	**$29.95**
For other lengths and genders, see p. 86.		
DB37 Interface (RS-449) Cable, 10-ft. (3.0-m) Male/Male	EDN37J-0010-MM	**$43.95**
For other lengths and genders, see p. 110.		
RS-530 Adapter Cable	B1BB10152	**$35.28 + $.76 /ft.**
X.21 Adapter Cable 25-ft. (7.6-m) Male/Female	EHN001-0025-MF	**$43.05**
Call for other lengths.		

RS-232↔RS-485/449 Interface Converter

Synchronous RS-485/449 Conversion.

- **Full RS-485 sync conversion: data handshaking and clock signals.**

232
485/449
(J2) RS-232
(J1) RS-485
POWER

The BLACK BOX® RS-232↔RS-485/449 Interface Converter supports full-duplex operation and hardware handshaking. And it's transparent to speed and protocol so you can use it for a variety of applications.

It provides bidirectional synchronous or asynchronous conversion for all commonly used RS-232 and RS-485 signals. Each port is selectable for DTE (data-terminal equipment) or DCE (data-communications equipment).

PLUS! For half-duplex operations, see the IC108A–IC109A on **p. 322.**

SPECIFICATIONS

Signals Supported — All data, handshake, and timing
Speed — 64 Kbps
CE Approval — IC485A-R3
Connectors — RS-232 Port: DB25 female; RS-485 Port: DB37 female
Indicators — (7) LEDs: (1) Power, (2) DSR, (2) CTS, (2) Data
Power — Standalone: 115 VAC, 60 Hz (230-VAC version on request); Card: 11.9 watts
Size — Standalone: 2.3"H x 8"W x 11.9"D (5.8 x 20.3 x 30.2 cm); Card: 1.2"H x 7.5"W x 11.4"D (3 x 19 x 28.9 cm)
Weight — Standalone: 1.8 lb. (0.8 kg); Card: 1.3 lb. (0.6 kg)

Item	Code	Price
RS-232↔RS-485/449 Interface Converter		
Standalone	IC485A-R3	**$305.00**
Rackmount Card	IC485C-R3	**$265.00**
For your Rackmount Cards, order our...		
8-Card Rack	RM060	**$425.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
Specify gender when ordering. For other lengths, see p. 83.		
DB37 Interface (RS-449) Cable, 10-ft. (3.0-m) Male/Male	EDN37J-0010-MM	**$43.95**
For other lengths and genders, see p. 110.		

Data Isolators

Stop Interference—Get Transformer Isolation.

EXCLUSIVE
232
422/TTL
BLACK BOX
HIGH SPEED RS-232 DATA ISOLATOR
INPUT
OUTPUT

- **Provide 2500-volt isolation between two connected RS-232, RS-422, or TTL devices.**
- **Versions for normal and high-speed data communications.**
- **Available with interface conversion.**
- **Industry-standard pinning for complete compatibility.**

These Data Isolators from Black Box provide 2500-volt signal-ground isolation protection between two connected RS-232, RS-422, or TTL devices. Models are also available to provide interface conversion from RS-232 to RS-422 or TTL. Use any of the Isolators for outdoor runs or other applications that may produce ground loops or other interference problems.

SPECIFICATIONS

Maximum Speed — IC106A-R2: 19.2 Kbps; IC105A-R2: 200 Kbps
CE Approval — 230-VAC versions: IC106AE-R2, IC105AE-R2
Interface — RS-232, RS-422
Connectors — (2) DB25F
Indicators — LEDs: (2) Power On
Power — 115 VAC/60 Hz or 230 VAC/50 Hz, switch-selectable
Size — 1.8"H x 8"W x 6.3"D (4.6 x 20 x 16 cm)
Weight — 2 lb. (0.9 kg)

FAXBACK INFORMATION
Request Document Number: 13332
Call 412-746-5500 Anytime

Item	Code	Price
RS-232↔RS-422 Isolator	IC106A-R2	**$329.00**
High-Speed RS-232↔RS-422 Isolator	IC105A-R2	**$419.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83. Specify gender when ordering.		
AT® Premium Modem Cable, 10-ft. (3.0-m)	EVMBMC-0010	**$19.95**
For other lengths, see p. 109.		
RS-530 Data Cable (25-pin), 10-ft. (3.0-m) Male/Male	EVN530-0010-MM	**$41.95**
For other lengths and genders, see p. 88.		

* * *

RS-232↔RS-423/RS-449 Adapter

Convert to RS-423.

The Converter for DEC Equipment.

- **Nonpowered—use it anywhere!**
- **Easy to use.**

BLACK BOX
449 ADAPTER
232
423/449

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!

The Converter for DEC™ equipment. By using the RS-449 pinning assignments, you can convert from RS-232 to RS-423.

Set handshaking with the two-position switch—it's easy. The Adapter is nonpowered so you can use it anywhere—and you don't need to stay near an outlet.

The Ready Pak for the IC506A includes the Adapter and a 10-ft. RS-449 Cable (EDN37J-0010-MM).

SPECIFICATIONS

Signals Supported — All data, handshake, and timing
CE Approval — All items listed are approved
Connectors — IC505A: (1) DB25 female, (1) DB37 male
Size — 0.9"H x 3.1"W x 3.4"D (2.3 x 7.9 x 8.6 cm)
Weight — 0.3 lb. (0.1 kg)

Item	Code	Price
RS-232↔RS-423/449 Adapter		
449 DCE to 232 DTE Adapter	IC505A	**$105.00**
449 DTE to 232 DCE Adapter	IC506A	**$105.00**
Ready Pak Includes the Adapter (IC506A) **plus** (1) 10-ft (30-m) RS-449 Cable	IC506A-CABPAK	**$148.95**
remember to order cables DB37 Interface (RS-449) Cable 10-ft. (3.0-m) Male/Male	EDN37J-0010-MM	**$43.95**
For other lengths and genders, see p. 110.		

* * *

MIL Converter

The MIL Converter—Only from Black Box.

- **Converts RS-232 to Military Standard 188/114 and 188C.**
- **For use with DTE or DCE and balanced or unbalanced devices.**

EXCLUSIVE
232
MIL STD

SPECIFICATIONS

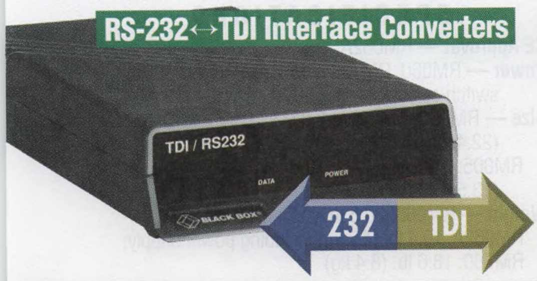
Speed — 64 Kbps Maximum
Power — Standalone: 115/230 VAC, 60/50 Hz; Rackmount Card: Interface powered
Connectors — (2) DB25 female; Interfaces are DTE/DCE selectable
Size — 2.5"H x 8"W x 6.3"D (6.4 x 20.3 x 16 cm)
Weight — 3 lb. (1.4 lb.)

The Converter's DB25 connectors are pinned to RS-530 specifications. Card versions perform MIL 188C conversion with a custom cable. For custom cables, call Tech Support at **412-746-5500.**

Item		Code	Price
MIL Converter			
Standalone	Async	IC235A	**$320.00**
	Sync	IC236A	**$360.00**
Rackmount Card	Async	IC231-C	**$285.00**
	Sync	IC232-C	**$325.00**
MIL 188 Rack		RM016	**$360.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)		ECM25C-0010	**$23.95**
For other lengths, see p. 83. Specify gender when ordering.			

* * *

RS-232↔TDI Interface Converters



Link RS-232 Devices to Your Async TDI Loop and Break the TDI 1000-Foot Barrier.

- Adapt RS-232 signals for transmision over a two-wire/direct-connect Burroughs® interface.
- Suppport for async transmission to 38.4 Kbps.
- Distances from thousands of feet to thousands of miles, depending on the async modem or line driver you use.

Item	Code	Price
RS-232↔TDI Interface Converter	IC301A	**$195.00**
Modem 325	MD278A	**See page 409.**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM12C-0010	**$17.95**
For other lengths, see p. 83. Specify gender when ordering.		

RS-232↔V.35 Interface Converters

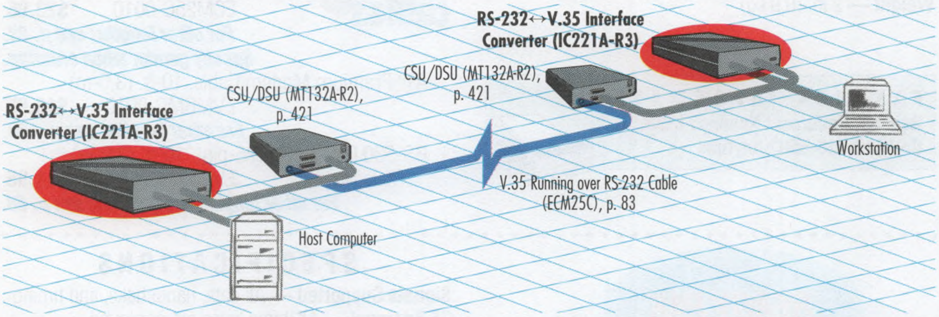
Save Money!

Access V.35 Lines with RS-232 Equipment.

232
V.35
BLACK BOX®
DSR CTS DATA
PWR
DSR CTS DATA
232 ↔ V.35

- **Connect your existing RS-232 equipment to V.35 without expensive upgrades.**

Black Box can save you the expense of costly V.35 upgrades. With this Converter, you can connect inexpensive RS-232 devices to V.35 lines! This AC-powered Converter is perfect for distances up to 2000 feet. It operates bidirectionally at speeds up to 64 Kbps (synchronous only) and supports 11 active RS-232 leads and 14 active V.35 leads. LEDs tell you at a glance when there's activity on your line. Also available in a rackmount-card version.


RS-232↔V.35 Interface Converter (IC221A-R3)
CSU/DSU (MT132A-R2), p. 421
CSU/DSU (MT132A-R2), p. 421
RS-232↔V.35 Interface Converter (IC221A-R3)
Workstation
V.35 Running over RS-232 Cable (ECM25C), p. 83
Host Computer

Item		Code	Price
RS-232↔V.35 Interface Converters	Standalone	IC221A-R3	**$315.00**
	Rackmount Card	IC221C-R3	**$280.00**
For your Rackmount Cards, order our...			
8-Card Rack		RM060	**$425.00**
remember to order cables	V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**
		For other lengths or genders, see p. 89.	
	RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
		For other lengths, see p. 83. Specify gender when ordering.	

SPECIFICATIONS

Maximum Distance — 2000 ft. (609.6 m)
Operation — Synchronous, transparent to protocol
Speed — Up to 64 Kbps
CE Approval — 230-VAC version: IC221AE-R3
Connectors — RS-232: DB25 male;
V.35: 34-pin female "M" block
Indicators — DSR, CTS, data, and power
Power — 115 VAC, 60 Hz, 13 watts (230-VAC version on request)
Size — Standalone: 2.1"H x 8.8"W x 11.5"D (5.3 x 22.4 x 29.2 cm);
Card: 7.5"H x 10.5"W (19.1 x 26.7 cm)
Weight — 2 lb. (0.9 kg)

FAXBACK INFORMATION
Request Document Number: 10195
Call 412-746-5500 Anytime

RS-422↔V.35 Interface Converter

Fast 2.5 Mbps for T1 Applications.

RS-422
V.35
POWER
422/449
V.35

- **Fast conversion from RS-422↔V.35.**

Convert all commonly used synchronous V.35 and RS-422 signals bidirectionally—at speeds up to 2.5 Mbps! Because the Converter is transparent to flow control, transmission is never delayed—so it's perfect for T1 applications. Strap-selectable DCE or DTE configuration provides quick setup. The heavy-duty plastic casing makes it ideal for industrial settings.

SPECIFICATIONS

Speed — Up to 2.5 Mbps
CE Approval — IC483A-R2; 230-VAC: IC483AE-R2
Connectors — RS-422: (1) DB37 female (pinned to RS-449 specifications);
V.35: (1) 34-pin M-block female
Power — 115 VAC, 60 Hz, 16 watts
Size — Standalone: 2.3"H x 8"W x 11.9"D (5.8 x 20.3 x 30.2 cm);
Card: 7.5"W x 10.5"D (19.1 x 26.7 cm)
Weight — 2 lb. (0.9 kg)

Item		Code	Price
422↔V.35 Interface Converter			
	Standalone	IC483A-R2	**$339.00**
	Rackmount Card	IC483C-R2	**$299.00**
For your Rackmount Cards, order our...			
8-Card Rack		RM060	**$425.00**
remember to order cables	DB37 Interface (RS-449) Cable 10-ft. (3.0-m) Male/Male	EDN37J-0010-MM	**$43.95**
		For other lengths, see p. 110.	
V.35 Interface Cable, 10-ft. (3.0-m)	Male/Male	EYN450-0010-MM	**$83.95**
		For other lengths or genders, see p. 89.	

Interface Converter Racks

Centralize Multiple Converters with One AC Outlet.

PLUS!
MicroRACKs, see p. 328.

RM700

- Consolidate your interface converters.
- Keep your cables tangle-free.
- Your cards stay hot-swappable.

Item	Code	Price
8-Card Rack	RM060	**$425.00**
11-Card Rack (48-VDC)	RM062A	**$775.00**
Rack Nest 400 (16-Card)	RM700A	**$700.00**

SPECIFICATIONS

CE Approval — RM062A
Power — RM060, RM700: 115/230 VAC, 60/50 Hz, switch-selectable; RM062A: 48 VDC
Size — RM060, RM062A: 8.8"H x 19"W x 12"D (22.4 x 48.3 x 30.5 cm);
RM005: 5.3"H x 19"W x 10"D (13.5 x 48.3 x 25.4 cm)
Weight — RM060: 20.5 lb. (9.3 kg);
RM062A: 10.4 lb. (4.7 kg) including power supply;
RM700: 18.6 lb. (8.4 kg)

G.703 Codirectional Converter

Get a Clean Connection to G.703.

G.703
V.35/X.21/449/530
BLACK BOX
G.703—V.35 CODIRECTIONAL

- Fast, transparent interface between G.703 and V.35, X.21, RS-449/422, and RS-530 equipment.
- Remote loopback and internal BERT.
- Activate analog and digital loopback using the front-panel switch or DTE interface.

SPECIFICATIONS

Operation — 4-wire full-duplex
Speed — 64 Kbps, 56 Kbps, 48 Kbps
CE Approval — All items listed are approved
Interface — All: G.703;
IC714A-V.35: V.35;
IC714A-X21: X.21/V.11;
IC714A-449: V.36/V.11 (RS-449/422);
IC714A-530: EIA RS-530
Connectors — All: (1) DB25 female;
IC714A-V.35: 34-pin V.35;
IC714A-X21: DB15;
IC714A-449: DB25, DB25 to DB37 adapter;
IC714A-530: DB25
Power — 115/230 VAC, 60/50 Hz
Size — 1.8"H x 7.6"W x 9.5"D (4.4 x 19.3 x 24.4 cm)
Weight — 3.1 lb. (1.4 kg)

Item	Code	Price
G.703 Codirectional Converter		
V.35	IC714A-V35-R2	**$995.00**
X.21	IC714A-X21-R2	**$995.00**
RS-449	IC714A-449-R2	**$995.00**
RS-530	IC714A-530-R2	**$995.00**

All the cables you need are included.

◆ ◆ ◆

RS-232↔X.21 Interface Converters

Use Your RS-232 Equipment over High-Speed X.21 Lines.

XIC
IC933
232
X.21

Connect your RS-232 synchronous terminals and modems to equipment via high-speed X.21 standard interface trunk lines.

Each Converter is transparent to protocol and provides bidirectional data transfer along with complete electrical and mechanical conversion. The Converter comes complete with connectors and a 2-meter cable for easy installation.

SPECIFICATIONS

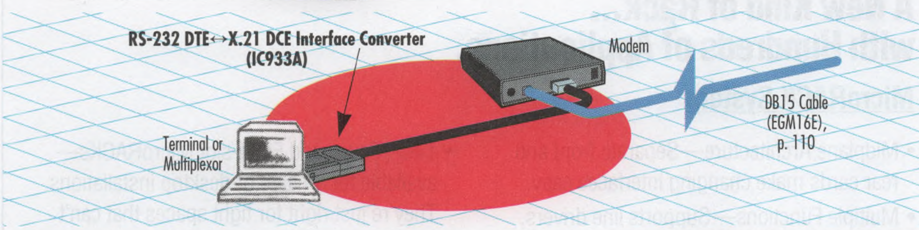
Operation — Full- or half-duplex
Speed — 64 Kbps
CE Approval — All items listed are approved
Interface — RS-232 or X.21
Connectors — IC933A: (1) DB25 male (DTE), (1) DB15 male (DCE);
IC944A: (1) DB25 male (DCE), (1) DB15 female (DTE)
Power — Nonpowered
Size — 0.8"H x 2.2"W x 3.5"D (2 x 5.5 x 9 cm) plus 2-m cable

Item	Code	Price
RS-232 DTE↔X.21 DCE Interface Converter	IC933A	**$300.00**
X.21 DTE↔RS-232 DTE Interface Converter	IC944A	**$300.00**
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

remember to order **cables**

For other lengths, see p. 83.
Specify gender when ordering.

For other lengths or genders, see p. 89.


RS-232 DTE↔X.21 DCE Interface Converter
(IC933A)
Modem
Terminal or Multiplexor
DB15 Cable (EGM16E), p. 110

◆ ◆ ◆

V.35↔X.21 Interface Converters

Convert High-Speed V.35 to X.21 DDS or X.21 to V.35.

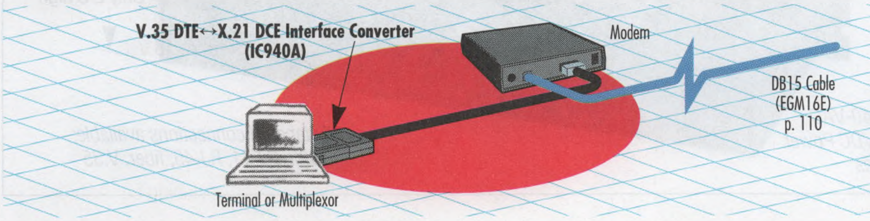
Make the most of your existing V.35 and X.21 equipment and networks with these miniature Interface Converters.

Connect your V.35 devices, such as terminals or multiplexors, to an X.21 device or digital data service with our IC940A. Or convert X.21 to V.35 with our IC941A-E. And you can do it in just minutes!

Both are transparent to all protocols—no adjustments are needed.

V.35/X.21 CONVERTER
VXC
V.35
X.21

Just plug the Converter into your V.35 and X.21 devices. The Converter comes complete with connectors and a 2-meter cable for easy installation.


V.35 DTE↔X.21 DCE Interface Converter
(IC940A)
Modem
DB15 Cable (EGM16E) p. 110
Terminal or Multiplexor

SPECIFICATIONS

Transmission Format — Synchronous, transparent to protocol
Transmission Mode — Full- or half-duplex
CE Approval — All items listed are approved
Connectors — IC940A: (1) 34-pin M block male/female, (1) DB15 male, 2-m cable; IC941A-E: (1) 34-pin M-block male/female, (1) DB15 female; 2-m cable
Power — IC940A: No power required;
IC941A-E: 230 VAC, external power supply
Size — 0.9"H x 2.2"W x 3.5"D (2.2 x 5.5 x 9 cm) plus 2-m cable
Weight — 0.9 lb. (0.4 kg)

Item	Code	Price
V.35 DTE↔X.21 DCE Converter		
V.35 F/X.21 M	IC940A-F	**$200.00**
V.35 M/X.21 M	IC940A-M	**$200.00**
X.21 DTE↔V.35 DCE Converter		
X.21 F/V.35 F	IC941A-EF	**$315.00**
X.21 F/V.35 M	IC941A-EM	**$315.00**
V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**
DB15 Cable, 10-ft. (3.0-m)	EGM16E-0010	**$25.95**

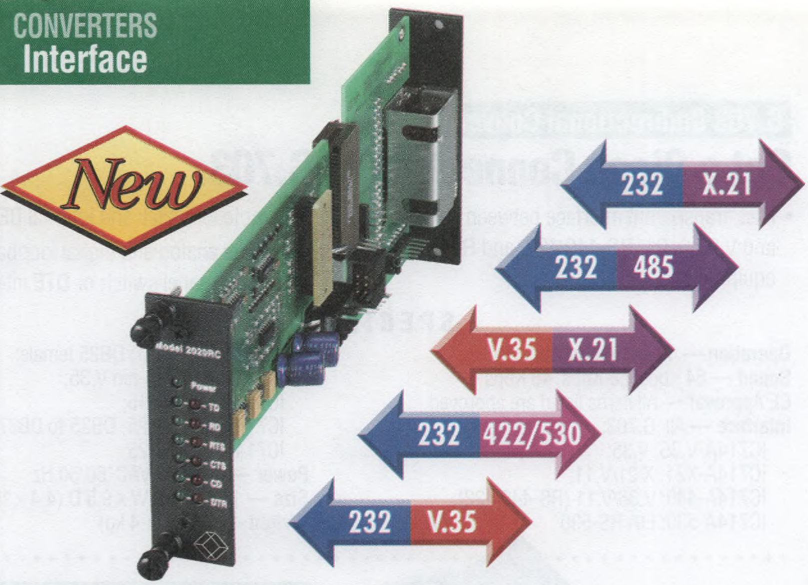
remember to order **cables**

For other lengths or genders, see p. 89.

Please specify gender when ordering.
For other lengths, see p. 110.

MicroRACK Cards

Connect to Your WAN with High-Speed Converters.



- **Use with bridges, routers, CSUs, and other WAN-access devices.**
- **Protocol-independent—they pass all appropriate data, clocking, and control signals.**
- **Support for data rates up to 128 Kbps (RS-232↔X.21), 384 Kbps (RS-232↔V.35), and 2.048 Mbps (X.21↔V.35).**
- **Two 16-bit elastic buffers ensure data integrity.**

RS-232↔V.35 MicroRACK Cards convert sync RS-232 to sync V.35 at data rates up to 384 Kbps. Both the RS-232 and V.35 interfaces are DTE/DCE-switchable.

RS-232↔X.21 MicroRACK Cards connect sync RS-232 to sync X.21, full- or half-duplex, at data rates up to 128 Kbps. And the RS-232 interface is DCE/DTE-switchable. You also get multiport interface conversion with this Card.

V.35↔X.21 MicroRACK Cards enable V.35 hardware to communicate with X.21 hardware at data rates up to 2.048 Mbps. The V.35 interface is DCE/DTE-switchable, and two 16-bit elastic buffers maximize reliability.

RS-232↔422/530 MicroRACK Cards convert async RS-232 to async RS-422/530 at data rates up to 19.2 Kbps in point-to-point applications.

RS-232↔RS-485 MicroRACK Cards convert async RS-232 to async RS-485 at data rates up to 115.2 Kbps in point-to-point or multipoint applications.

Item	Code	Price
MicroRACK Cards		
RS-232↔V.35	IC222C	**$295.00**
RS-232↔X.21	IC224C	**$595.00**
V.35↔X.21	IC225C	**$695.00**
Async RS-232↔422/530 (2-Port)		
RJ-11/RJ-11	IC474C	**$120.00**
RJ-45/RJ-45	IC475C	**$120.00**
Async RS-232↔RS-485 (2-Port)		
RJ-11/RJ-11	IC479C	**$194.00**
RJ-45/RJ-45	IC480C	**$194.00**
MicroRACK		
2-Port	RM202	**$110.00**
4-Port	RM204	**$165.00**
8-Port	RM208	**$240.00**
16-Port	RM216	**$325.00**
Each Rack needs at least one power supply...		
AC Power Supply	PS460A	**$140.00**
48-VDC Power Supply	PS461A	**$400.00**
remember to order cables Adapter Cables, UD26M		
RS-232		
DB25M	EHN092-232M	**$49.95**
DB25F	EHN092-232F	**$49.95**
V.35		
M/34M	EHN092-V35M	**$89.95**
M/34F	EHN092-V35F	**$89.95**
X.21		
DB15M	EHN092-X21M	**$49.95**
DB15F	EHN092-X21F	**$49.95**

SPECIFICATIONS

Transmission Format — IC222C: Synchronous, transparent to protocol, full or half duplex; passes all appropriate signals; IC224C–IC225C: Synchronous; IC474C–IC475C, IC479C–IC480C: Asynchronous

CE Approval — IC222C, IC224C–IC225C, IC475C, RM216

Indicators — IC222C: Bilevel red/green LED indicators for TD, RD, RTS, CTS, CD, and DTR, (1) Green LED for power; IC224C–IC225C: Bilevel LED indicators for TD, RD, TC, RC, and XC; (1) Green LED for Indication and Control; (1) Red LED for elastic buffer status; IC474C–IC475C, IC479C–IC480C: Bilevel red/green LED indicators for TD, RD, and CD

Size — 3.1"H x 5.4"W x 1"D (7.9 x 13.7 x 2.5 cm)

Weight — 1 lb. (0.5 kg)

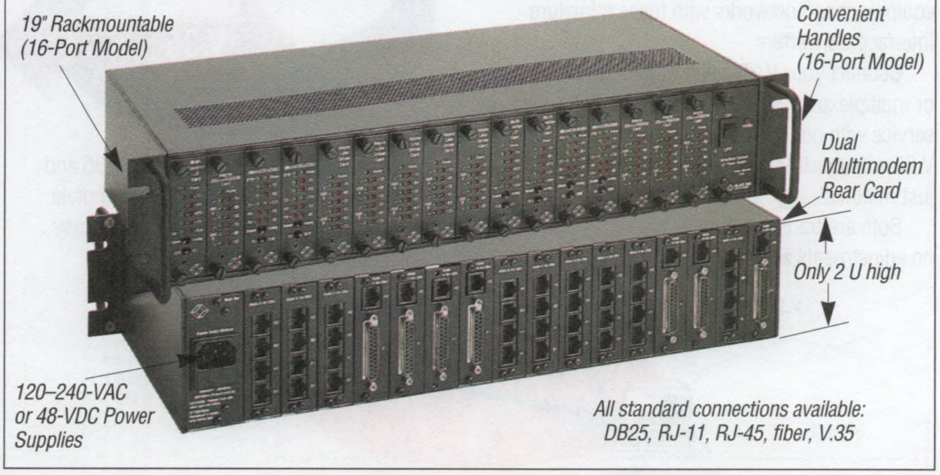
FAXBACK INFORMATION
Request Document Number: 19077
Call 412-746-5500 Anytime

MORE! About our MicroRACK System, **see pp. 378–379.**

A New Kind of Rack... with Hundreds of Applications.

MicroRACK System

- Midplane Architecture—Separate front and rear cards make changing interfaces easy.
- Multiple Functions—Supports line drivers, interface converters, fiber modems, CSU/DSUs, and synchronous modem eliminators.
- Hot-Swappable—MicroRACK Cards can be replaced without powering down so you cut your network's downtime.
- Two-, Four-, and Eight-slot MicroRACKs—available for smaller or desktop installations. They're just right for tight spaces that can't accommodate a full-sized (16-slot) rack.
- Optional Dual Cards—Some Mini Driver Cards have two drivers in one Card. One MicroRACK chassis can hold up to 32 Mini Drivers!


19" Rackmountable (16-Port Model)
Convenient Handles (16-Port Model)
Dual Multimodem Rear Card
Only 2 U high
120–240-VAC or 48-VDC Power Supplies

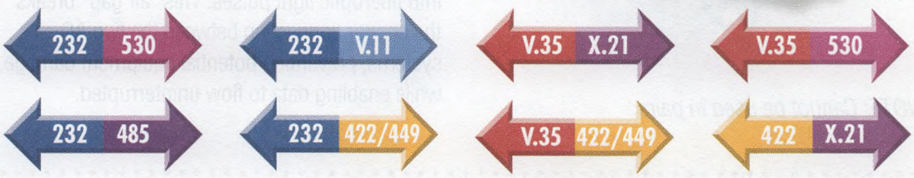
All standard connections available: DB25, RJ-11, RJ-45, fiber, V.35

Non-Powered Interface Converters

Compact Interface-Powered Converters for Most Common Interfaces.

RS-232
TO
RS-422/
RS-449
BLACK BOX
IC487A

- **Convert between most of the following: RS-232, V.35, RS-422, RS-485, RS-530, and X.21.**
- **Cable and connectors included.**
- **Most are transparent to protocol.**
- **Easy to install—just plug in the connectors and you're ready to go.**
- **Operate without AC power.**

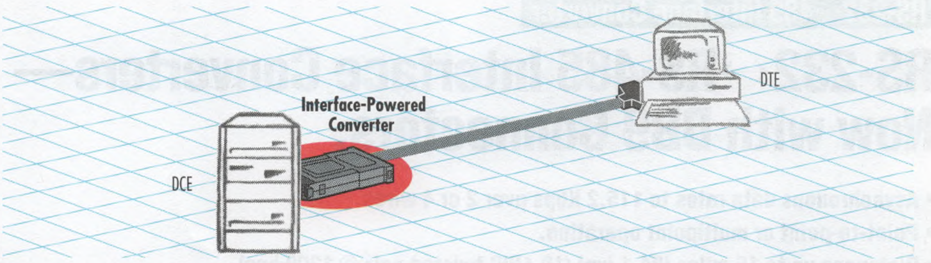


Connect incompatible interfaces without being tied to a nearby AC power outlet. These Interface Converters operate without AC power, relying on ultra-low power from the DTE or DCE interface signals. Use them in sync or async applications at speeds of up to 2 Mbps.

The Interface Converters perform the physical and electrical conversion between two interfaces and are designed to connect devices within a short range.

Installation is easy. Cable and the appropriate connectors are included for both interfaces, and the Interface Converter is ready to install right out of the box. Choose from fourteen different models.

All Converters but the IC486A adapt to sync or async applications. The RS-232 to RS-485 and RS-232 to V.11 Converters have a terminal block for attaching to a RS-485 device. All the other models come with a 6-foot (1.8-m) cable.



FAXBACK INFORMATION
Request Document Number: 12441
Call 412-746-5500 Anytime

SPECIFICATIONS

Protocol — IC952A–IC953A, IC237A, IC487A, IC954A, IC951, IC963, IC940A-M–IC940A-F, IC482A, IC960A–IC961A, IC964A: sync or async; IC486A: async only

Speed — IC952A–IC953A, IC237A, IC487A-F, IC954A, IC951, IC963: Up to 200 Kbps; IC486A: Up to 38.4 Kbps; IC940A-M–IC940A-F, IC482A: Up to 2.048 Mbps; IC960A–IC961A, IC964A: 200 Mbps

CE Approval — All items listed are approved

Switch-Selectable DTE/DCE — IC952A–IC954A, IC487A-F

Power — All models: From the interface, except IC951A, which comes with a power supply

Size — 0.9"H x 2.1"W x 4.3"D (2.3 x 5.3 x 10.9 cm)

Weight — 0.9 lb. (0.4 kg)

INTERFACE-POWERED CONVERTERS

Interface A	Interface B	Connector A	Connector B	Code	Price
RS-232	**V.11** (Data Only)	DB25, Female, DTE/DCE Selectable	5-Screw Terminal Block	IC952A	**$70.00**
		DB25, Male, DTE/DCE Selectable	5-Screw Terminal Block	IC953A	**$70.00**
	RS-530	DB25, Male, DTE/DCE	DB25, Female, DCE/DTE	IC237A	**$166.00**
	RS-485	DB25, Female, DCE	5-Screw Terminal Block	IC486A	**$166.00**
	RS-422/RS-449	DB25, Male, DTE/DCE	DB37, Female, DCE/DTE	IC487A-F	**$166.00**
		DB25, Male, DTE/DCE	DB37, Male, DTE/DCE	IC954A-M	**$200.00**
RS-422	**X.21**	DB37, Male, DTE	DB15, Female, DCE	IC951A*	**$405.00**
		DB37, Female, DCE	DB15, Male, DTE	IC963A	**$162.00**
V.35		V.35, Male, DCE	DB15, Male, DTE	IC940A-M	**$200.00**
		V.35, Female, DCE	DB15, Male, DTE	IC940A-F	**$200.00**
		V.35, Male, DTE	DB15, Female, DCE	IC941A-M	**$315.00**
		V.35, Female, DTE	DB15, Female, DCE	IC941A-F	**$315.00**
	RS-422/RS-449	V.35, Male, DTE	DB37, Female, DCE	IC482A	**$124.00**
		V.35, Male, DCE	DB37, Male, DTE	IC960A	**$120.00**
	RS-530	V.35, Male, DCE	DB25, Male, DTE	IC961A	**$120.00**
		V.35, Male, DTE	DB25, Female, DCE	IC964A	**$150.00**

* Power Supply Included

RS-232↔422 Opto-Isolator

Send Your Data up to 19.2 Kbps with Opto-Isolation.

NOTE: Cannot be used in pairs.

- **Bidirectionally converts RS-232/RS-422 signals and prevents damaging ground loops.**
- **Available with DB25 M or F connectors.**

Transmitting data between buildings? You'd better guard against damaging ground loops. Ground loops occur when you link devices powered by separately grounded AC power sources. But a BLACK BOX® Opto-Isolator stops them by internally transforming electrical signals into fiberoptic light pulses. This "air gap" breaks the copper connection between the two AC systems, preventing potential equipment damage, while enabling data to flow uninterrupted.

SPECIFICATIONS

Operation — 4-wire, full-duplex, point-to-point
Protocol — Asynchronous
Speed — Transparent up to 19.2 Kbps
CE Approval — All items listed are approved
Connectors — RS-232: (1) DB25 female; RS-422: (1) 4-screw terminal block
Power — From both RS-232 and RS-422 interfaces
Size — 0.7"H x 2"W x 2.7"D (1.8 x 4.1 x 6.9 cm)
Weight — 0.1 lb. (<0.1 kg)

Item	Code	Price
RS-232↔422 Opto-Isolator		
Female	IC457A-F	**$135.00**
Male	IC457A-M	**$135.00**
remember to order cables: Category 5 Solid Conductor Cable, 2-Pair, Bulk, PVC	EYN717A	**$.15/ft.**

For specific lengths or plenum applications, see p. 115.

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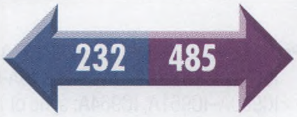
RS-232↔485 Interface Converter

RS-232↔RS-485 Interface Converters— Now with DB9 Connectors.

New
BLACK BOX
(412) 746-5500
RS232/485
Converter

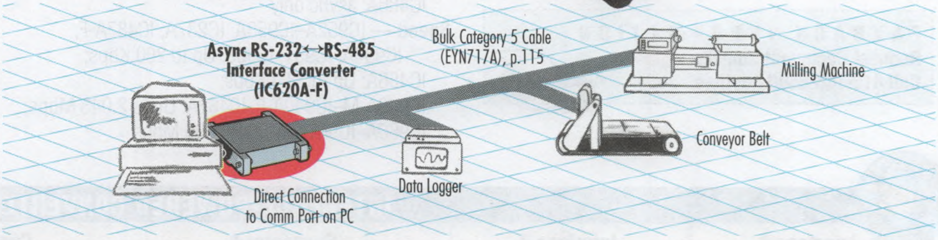
- **Asynchronous data rates to 115.2 Kbps over 2 or 4 wires.**
- **Point-to-point or multipoint operation.**
- **Distances up to 15 miles (24.1 km) (19 AWG twisted pair @ 1200 bps).**
- **Interface powered—no AC power or batteries required.**
- **Sends data and one control signal in each direction.**
- **Operates with or without transmit "echo."**



Over the years different industries have adopted different means of data transmission for different reasons. If you're going to communicate with them all, you need the right converters.

BLACK BOX® RS-232↔485 Converters with DB9 connectors enable you to connect directly to high-speed RS-232 equipment. They're ideal if you have a computer with RS-232 connectors controlling equipment with an RS-485 interface.

This RS-232↔485 Converter is similiar to the RS-485 Converters which have DB25 connectors (see **page 324**.) Both versions have built-in Silicon Avalanche Diode surge protection against data loss and equipment damage from transient surges. You can also "fine-tune" impedence and echo characteristics for your individual application.


Async RS-232↔RS-485 Interface Converter (IC620A-F)
Bulk Category 5 Cable (EYN717A), p.115
Milling Machine
Conveyor Belt
Data Logger
Direct Connection to Comm Port on PC

FAXBACK INFORMATION
Request Document Number: 19091
Call 412-746-5500 Anytime

SPECIFICATIONS

Maximum Distance — 4000 ft. (1219 m)
Protocol — Asynchronous
CE Approval — All items listed are approved
Connectors — IC620A: (1) DB9 male or female, (1) terminal block; IC623A: (1) DB9 male or female, (1) RJ-11; IC624C: (1) DB9 male or female, (1) RJ-45
Power — From the interface (RS-232)
Size — 2.5"H x 1.2"W x 0.8"D (6.4 x 3 x 2 cm)
Weight — 1 lb. (0.5 kg)

Item	Code	Price
RS-232↔RS-485 Interface Converter, DB9		
Female		
Terminal Block	IC620A-F	**$109.95**
RJ-11	IC623A-F	**$109.95**
RJ-45	IC624A-F	**$109.95**
Male		
Terminal Block	IC620A-M	**$109.95**
RJ-11	IC623A-M	**$109.95**
RJ-45	IC624A-M	**$109.95**

remember to order cables

For RJ-11 applications:		
Bulk Category 5 Cable, 2-Pair, PVC	EYN717A	**$.15/ft.**
For specific lengths and plenum applications, see p. 115.		
For RJ-45 applications:		
Category 5 Solid Conductor Cable, 4-Pair Custom Lengths, Straight-Pinned	EYN737MS	**$10.80 + .17/ft.**
For specific lengths and pinnings, see p. 68.		

For terminal block applications, use either cable above.

Mini Converter RS-232↔V.35 • MicroConverter V.24

Access V.35 Lines with RS-232 Equipment.

232
V.35
BLACK BOX
RS-232/V.35
MINI CONVERTER

- **Bidirectional RS-232/V.35 conversion.**
- **Six-foot integral cable for flexible convenience. Installs anywhere.**
- **Transfers all control signals.**
- **DTE/DCE-switchable.**
- **Interface-powered—no AC power needed.**

If your RS-232 device is no more than 6½ feet (2 m) from your V.35 equipment, a pair of these ultracompact RS-232↔V.35 Converters is your key to accessing V.35.

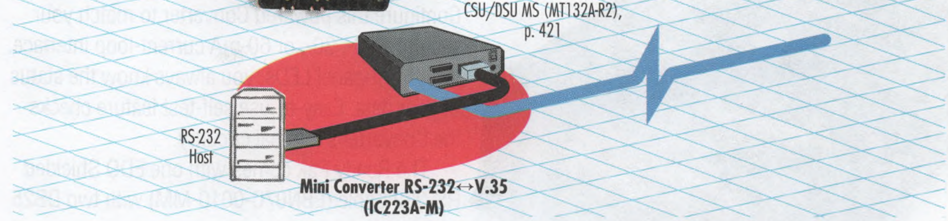
Mini Converter RS-232↔V.35

This Speedy Converter is the perfect solution for high-speed applications. It supports sync rates to a full *384 Kbps*. Just plug it inline to begin high-speed communication between otherwise incompatible RS-232 and V.35 devices.

MicroConverter V.24

This Converter operates bidirectionally at speeds up to 64 Kbps—synchronous only. It's DCE/DTE selectable and no AC outlet is necessary.

FAXBACK INFORMATION
Request Document Number: 13765,
Request Document Number: 10195,
Call 412-746-5500 Anytime


CSU/DSU MS (MT132A-R2), p. 421
RS-232 Host
Mini Converter RS-232↔V.35 (IC223A-M)

SPECIFICATIONS

Maximum Distance — 6.5 ft. (2 m)
Operation — Half- or full-duplex
Protocol — Synchronous, transparent to protocol
Speed — IC222A–IC223A: Up to 384 Kbps; IC720A: Up to 64 Kbps
CE Approval — All listed items are approved
Connectors — (1) DB25 and (1) 34-pin M-block linked with a 6-ft. (1.8-m) cable
Power — Interface-powered
Size — IC222A–IC223A: 0.7"H x 2"W x 2.6"D (1.8 x 5.1 x 6.6 cm); IC720A: 0.9"H x 2.1"W x 4.3"D (2.3 x 5.3 x 10.9 cm)
Weight — < 1 lb. (< 0.5 kg)

Item		Code	Price
Mini Converter RS-232↔V.35			
DB25 Female	/M34 Male	IC222A-M	**$295.00**
	/M34 Female	IC222A-F	**$295.00**
DB25 Male	/M34 Male	IC223A-M	**$295.00**
	/M34 Female	IC223A-F	**$295.00**
MicroConverter V.24			
V.35 Male		IC720A-M	**$390.00**
V.35 Female		IC720A-F	**$390.00**
For your Rackmount Cards, order our…			
8-Card Rack		RM060	**$425.00**

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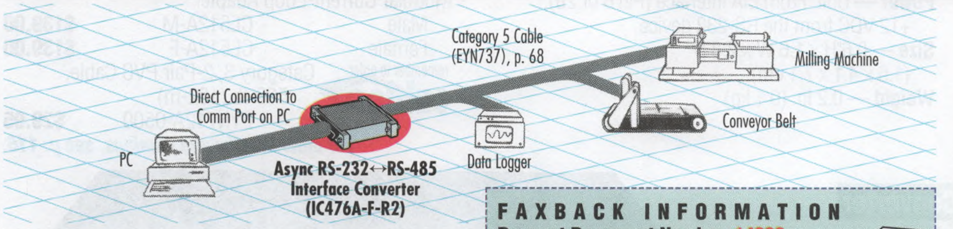
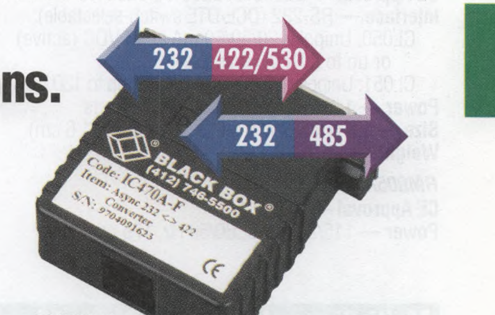
Async RS-232↔422/530 • RS-232↔485 Interface Converters

Use Your PC for RS-422 or RS-485 Communications.


Category 5 Cable (EYN737), p. 68
Milling Machine
Direct Connection to Comm Port on PC
Conveyor Belt
PC
Async RS-232↔RS-485 Interface Converter (IC476A-F-R2)
Data Logger



IC470A-F

FAXBACK INFORMATION
Request Document Number: 14096
Call 412-746-5500 Anytime

Async RS-232↔422/530 Interface Converter

- Transmits data only over two twisted pair.
- Point to point.
- Up to 19.2 Kbps.

Item		Code	Price
Async RS-232↔422/530 Interface Converters			
DB25 Male	/Terminal Block	IC470A-M	**$72.00**
	/DB25 Female	IC471A-M	**$72.00**
	/DB25 Male	IC472A-M	**$72.00**
DB25 Female	/Terminal Block	IC470A-F	**$72.00**
	/DB25 Female	IC471A-F	**$72.00**
	/DB25 Male	IC472A-F	**$72.00**
Terminal Block	/DB9 Male	IC473A-M	**$72.00**
	/DB9 Female	IC473A-F	**$72.00**

Async RS-232↔RS-485 Interface Converter

- Transmits data over one or two twisted pair.
- Point to point or multipoint.
- Up to 115.2 Kbps.

Item		Code	Price
Async RS-232↔RS-485 Interface Converters			
DB25 Male	/Terminal Block	IC476A-M-R2	**$99.00**
	/DB25 Female	IC477A-M-R2	**$102.00**
	/DB25 Male	IC478A-M-R2	**$102.00**
DB25 Female	/Terminal Block	IC476A-F-R2	**$99.00**
	/DB25 Female	IC477A-F-R2	**$102.00**
	/DB25 Male	IC478A-F-R2	**$102.00**

remember to order cables

	Code	Price
RS-530 Data Cable, 10-ft. (3.0-m)	EVN530-0010	**$41.95**
For other lengths, see p. 88. Specify gender when ordering.		
For terminal block applications:		
Category 5 Solid Conductor Cable, 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		

Other applications require different cables. Call Tech Support to make sure you order the right one.

SPECIFICATIONS

Maximum Distance — 4000 ft. (1219 m)
Operation — IC470A–IC473C: Full-duplex, 4-wire unconditioned twisted pair; IC476A-R2–IC478C: Half- or full-duplex, 2- or 4-wire unconditioned twisted pair
Protocol — Asynchronous
Speed — IC470A–IC473C: Up to 19.2 Kbps; IC476A-R2–IC478C: Up to 115.2 Kbps
CE Approval — All items listed are approved
Connectors — IC470A: (1) DB25 male or female, (1) terminal block; IC471A: (1) DB25 male or female, (1) DB25 female; IC472A: (1) DB25 male or female, (1) DB25 male; IC473A: (1) DB9 male or female, (1) terminal block; IC476A-R2: (1) DB25 male or female, (1) terminal block; IC477A-R2: (1) DB25 male or female, (1) DB25 female; IC478A-R2: (1) DB25 male or female, (1) DB25 male;
Power — From the interface (RS-232)
Size — IC470A–IC473A: 2.2"H x 1.8"W x 0.8"W (5.6 x 4.6 x 2 cm); IC476A-R2–IC478A-R2: 2.7"H x 2.1"W x 0.7"D (6.9 x 5.3 x 1.8 cm)
Weight — <1 lb. (<0.5 kg)

Yes, We Support Current Loop!

RS-232↔Current-Loop Interface Converters

232
CURRENT LOOP
BLACK BOX
232/CL-E
RX TX
CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!

NOTE: The RS-232↔Current-Loop Interface Converter (232/CL-E) can be the active current-loop device; the others are passive only.

Our Most Versatile Current-Loop Converter!

AC-Powered (CL050A, CL050-C—Active or Passive & CL051A, CL051-C—Passive Only)—Configure this powered Converter to match your system's 20-, 30-, or 60-mA current-loop interface. With front-panel LEDs, you always know the status of your data. Easy-to-use self-test feature checks the Converter's internal circuitry.

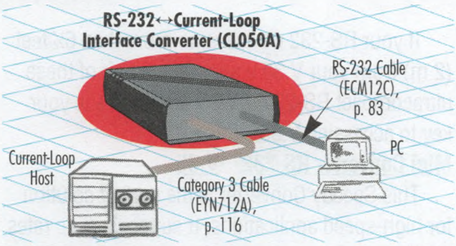
The Ready Pak comes with one EDQ Shielded RS-232 Cable (EBN07C-0010-MM) with two DB25 male connectors.

Interface-Powered (CL412A)—Features a 4-screw terminal block for use with twisted-pair cable.

The Interface-Powered Converter connects to either a modem or mux. Just flip the switch to attach a terminal or computer.

Your RS-232 devices are protected from dangerous transients. Optical isolators in both the Transmit and Receive loops keep out electrical interference.

Interface-Powered, Modular Connectors (CL512A)—Get all the features of the CL050A, *plus* RJ-11 connectors for easy connection to your wallplates.


RS-232↔Current-Loop Interface Converter (CL050A)
RS-232 Cable (ECM12C), p. 83
PC
Current-Loop Host
Category 3 Cable (EYN712A), p. 116

Item	Code	Price
RS-232↔Current-Loop Interface Converter (232/CL-E)		
Standalone	CL050A	**$199.00**
The Ready Pak includes: the Converter **and** (1) EDQ Shielded RS-232 Cable	CL050A-CABPAK	**$222.95**
Rackmount Card	CL050-C	**$155.00**
130-VDC, 60-mA Converter, Passive Only		
Standalone	CL051A	**$247.00**
Rackmount Card	CL051-C	**$207.00**
16-Card Multi-Function Rack	RM005	**$435.00**
RS-232↔Current-Loop Interface-Powered Converter		
Male	CL412A-M	**$119.00**
Female	CL412A-F	**$119.00**
Modular Current-Loop Adapter		
Male	CL512A-M	**$139.00**
Female	CL512A-F	**$139.00**
remember to order cables Category 3, 2-Pair PVC Cable, 500-ft. (152-m)	EYN712A-0500	**$29.95**

For other lengths and pinnings, see p. 116.

SPECIFICATIONS

CL050A, CL050-C & CL051A, CL051-C:
Operation — Full- or half-duplex
CE Approval — CL050-C, CL051A, CL051-C
Interface — RS-232 (DCE/DTE switch-selectable);
CL050: Unipolar 20/30/60 mA at 18 VDC (active) or up to 30 VDC (passive);
CL051: Unipolar 20/60 mA (passive) up to 130 VDC
Power — 115/230 VAC, 60/50 Hz, 12 watts
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)
Weight — 1.5 lb. (0.7 kg)

RM005A:
CE Approval — Yes
Power — 115/230 VAC, 60/50 Hz, 175 watts max.
Size — 5.3"H x 19"W x 10.5"D (13.5 x 48.3 x 26.7 cm)
Weight — 11.8 lb. (5.4 kg)

CL412A & CL512A:
Operation — Passive, unipolar 20-mA current loop; full-duplex only
CE Approval — All items listed are approved
Interface — RS-232; 20-mA current loop
Power — Unit: From EIA interface (Pin 6 or 20), +12 VDC from the RS-232 device
Size — 0.6"H x 1.6"W x 2.8"D (1.5 x 4.1 x 7.1 cm)
Weight — 0.2 lb. (0.1 kg)

Multi-Channel RS-232↔Current-Loop Converter

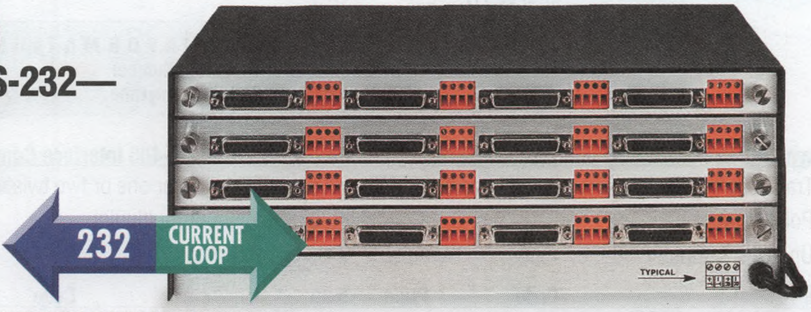
Link up to 16 Current-Loop Ports to RS-232—Bidirectionally!

- **Connect 4, 8, or 16 RS-232 ports to as many current-loop circuits—bidirectionally.**
- **Works in active or passive mode, half-or full-duplex.**
- **Both modes are switch-selectable.**

The Multi-Channel RS-232↔Current-Loop Converter matches 4, 8, or 16 RS-232 ports with the same number of current-loop circuits for conversion both ways.

This efficient Converter is the most compact solution for a large site. You can use just one unit instead of 4, 8, or 16 single-channel converters.

Just turn a switch to choose your operating mode. In active mode, the converter supplies the 20-mA current-loop power; in passive mode, 20-mA current-loop power is provided by the attached active device. Choose from half- or full-duplex with just the flip of a switch.



SPECIFICATIONS

Speed — Up to 9600 bps
CE Approval — All items listed are approved
Interface — RS-232; 20-mA current loop, unipolar
Connectors — (4), (8), or (16) DB25 female DTE; (4), (8), or (16) 4-position terminal blocks (T+, T-, R+, R-) support Pins 2 and 3 with Pins 4 and 20 tied high
Power — 115/230 VAC, 60/50 Hz (switch-selectable), 30 watts (60 watts for CL216A)
Size — CL204A, CL208A: 2.8"H x 12.8"W x 7.5"D (7.1 x 32.5 x 19.1 cm);
CL216A: 5"H x 12.8"W x 7.5"D (12.7 x 32.5 x 19.1 cm)
Weight — CL204A: 4.1 lb. (1.9 kg);
CL208A: 4.9 lb. (2.2 kg); CL216A: 8.2 lb. (3.7 kg)

NOTE: For DTE connection order our Specialty Cross-Pinned Cable (EYN254C), listed below.

Item	Code	Price
Multi-Channel RS-232 ↔ Current-Loop Converter		
4-Channel	CL204A	**$405.00**
8-Channel	CL208A	**$715.00**
16-Channel	CL216A	**$1330.00**
remember to order cables Category 3, 2-Pair PVC Cable, 500-ft. (152-m)	EYN712A-0500	**$29.95**

For other lengths and pinnings, see p. 116.

Item	Code	Price
Specialty Cross-Pinned Cable	EYN254C	**$20.95 + $.43/ft.**

For other lengths and genders, see p. 111.

High-Speed RS-232↔Current-Loop Interface Converter

Integrate Current-Loop Equipment with Your System.

- Converts async data between RS-232 devices and current-loop hosts or devices.
- External DCE/DTE Switch for easy RS-232 connections—no crossover cables.
- Opto-isolated to eliminate ground loops.

SPECIFICATIONS

Operation — Full- or half-duplex
Speed — 115.2 Kbps
CE Approval — All items listed are approved
Interface — RS-232, 20-mA current loop
Indicators — Active: (3) LEDs: TD, RD, Power
Power — Active: 115-VAC, 60-Hz or 230-VAC, 50-Hz external wallmount transformer;
Passive: From interface (RS-232)
Size — 1.2"H x 0.8"W x 2.5"D (3 x 2 x 6.4 cm)

232
CURRENT LOOP
BLACK BOX
(412) 746-5500
HS RS232 ↔ Current Loop Converter - Active
DTE DCE

FAXBACK INFORMATION
Request Document Number: 14137
Call 412-746-5500 Anytime

Item	**Code**	**Price**
High-Speed RS-232↔Current Loop Converter		
Active/Passive		
DB25M/Terminal Block	CL090A-M	**$75.00**
RJ-11	CL091A-M	**$75.00**
RJ-45	CL092A-M	**$75.00**
DB25F/Terminal Block	CL090A-F	**$75.00**
RJ-11	CL091A-F	**$75.00**
RJ-45	CL092A-F	**$75.00**
Passive		
DB25M/Terminal Block	CL095A-M	**$65.00**
RJ-11	CL096A-M	**$65.00**
RJ-45	CL097A-M	**$65.00**
DB25F/Terminal Block	CL095A-F	**$65.00**
RJ-11	CL096A-F	**$65.00**
RJ-45	CL097A-F	**$65.00**
remember to order cables: Category 3 Solid Bulk Cable, 2-Pair, PVC	EYN712A	**$.07/ft.**
For preterminated lengths, see p. 116.		
Category 5 Solid Conductor Cable, 10-ft. (3.0-m) Straight-Pinned	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		

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TTL Converter

Compact, Interface-Powered RS-232↔TTL Conversion.

232
TTL
BLACK BOX®

EXCLUSIVE

- Converts TTL data to RS-232 and RS-232 to TTL.
- Speeds up to 19.2 Kbps.
- No AC outlet required.

SPECIFICATIONS

Maximum Speed — 19.2 Kbps
CE Approval — IC505A–IC506A, IC812A; 230-VAC, 50-Hz version: IC813AE
Interface — 232 (DCE)↔TTL (DTE)
Connectors — DB25 male, DB25 male
Indicators — LEDs: (2) Power On
Power — Interface Powered
Size — 3.5"H x 2.1"W x 0.5"D (8.9 x 5.3 x 1.3 cm)
Weight — 2 lb. (0.9 kg)

FAXBACK INFORMATION
For IC047A: 11440,
For All Other Converters: 14168,
Call 412-746-5500 Anytime

Item	**Code**	**Price**
TTL Converter	IC156A	**$102.00**
remember to order cables: RS-232 Cable, 10-ft. (3.0-m)	ECM12C-0010	**$17.95**
For other lengths, see p. 83. *Specify gender when ordering.*		
If your PC has a DB9 serial port, order:		
AT® Modem Cable, 6-ft. (1.8-m)	EVMBMC-0006	**$17.95**
For other lengths, see p. 109.		

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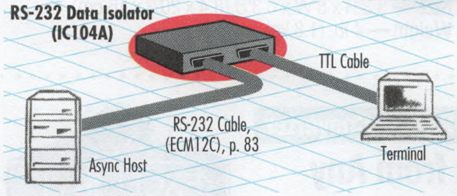
Data Isolators

Stop Interference—Get Transformer Isolation.

EXCLUSIVE

- **Provide 2500-volt isolation between two connected RS-232, RS-422, and TTL devices.**
- **Versions for normal and high-speed data communications.**
- **Models available with interface conversion.**
- **Industry-standard pinning for complete compatibility.**

These Data Isolators from Black Box provide 2500-volt signal-ground isolation protection between two connected RS-232, RS-422, or TTL devices. Models are also available to provide interface conversion from RS-232 to RS-422 or TTL. Use any of the Isolators for outdoor runs or other applications that may produce ground loops or other interference problems. And now industry-standard pinning makes these Data Isolators even more compatible.



SPECIFICATIONS

Maximum Data Rate — IC104A: 19.2 Kbps; IC103A: 200 Kbps
CE Approval — 230-VAC Versions: IC104AE, IC103AE
Interface — IC103A–IC104A: RS-232, TTL
Connectors — All models: (2) DB25F
Indicators — LEDs: (2) Power On
Power — 115 VAC/60 Hz or 230 VAC/50 Hz, switch-selectable
Size — 1.8"H x 8"W x 6.3"D (4.6 x 20 x 16 cm)
Weight — 2 lb. (0.9 kg)

FAXBACK INFORMATION
Request Document Number: 13332
Call 412-746-5500 Anytime

RS-232↔TTL Data Isolator
RS-232 DCE
POWER
TTL-DTE
BLACK BOX
(412) 746-5500

Item	**Code**	**Price**
RS-232↔TTL Isolator	IC104A	**$269.00**
High-Speed RS-232↔TTL Isolator	IC103A	**$299.00**
remember to order cables: RS-232 Cable, 10-ft. (3.0-m)	ECM12C-0010	**$17.95**
For other lengths, see p. 83. *Specify gender when ordering.*		
If your PC has a DB9 serial port, order:		
AT® Modem Cable, 6-ft. (1.8-m)	EVMBMC-0006	**$17.95**
For other lengths, see p. 109.		

232↔488 HP-IB Interface Converter and 488 Controller

Add RS-232 or RS-422 Devices to Your IEEE-488 Bus.

232
488 HP-IB
BLACK BOX (412) 746-5500
488 CONTROLLER
TALK
LISTEN
SRQ
ERROR
POWER
232↔488 CONVERTER
SEND
RECEIVE
POWER

- The BLACK BOX® 232↔488 Interface Converter (IC026A-R2) enables you to control one IEEE-488 printer or peripheral through a PC serial port. Or an IEEE-488 device can control an RS-232 or RS-422 device.
- The Converter has a 32-KB buffer to unload print jobs fast.
- Control up to 14 IEEE-488-bus instruments from any RS-232 async device with our 488 Controller (IC027A-R2).

NOTE: Not intended for use with tape drives, hard drives, or HP25XX, HP26XX, or HP29XX printers.

FAXBACK INFORMATION
For 232↔488 Converter: 10470,
For 488 Controller: 11440,
Call 412-746-5500 Anytime

SPECIFICATIONS

Control Switches — Power: internal DIP switches for RS-232 and IEEE parameters
Data Buffer — 32 KB, dynamically allocated
Data Format — 7 or 8 data bits, 1 or 2 stop bits; parity odd, even, mark, space, or disabled
Speed — 110 bps to 57.6 Kbps
CE Approval — 230-VAC versions: IC026AE-R2–IC028AE-R2
Interface — IEEE-488: RS-232/RS-422 DCE
Connectors — IEEE-488: (1) female; RS-232/RS-422: (1) DB25 female
Indicators — (5) LEDs
Power — 115 VAC, 60 Hz, 7 watts (wallmount) (230-VAC version on request)
Size — 2.7"H x 5.4"W x 7.5"D (6.9 x 13.7 x 19.1 cm)
Weight — 2.5 lb. (1.1 kg); Power supply: 0.9 lb. (0.4 kg)

Item	Code	Price
232↔488 Interface Converter	IC026A-R2	**$605.00**
488 Controller	IC027A-R2	**$860.00**
remember to order cables IEEE-488 Cable		
9643M 6.6-ft. (2-m)	EXN02M	**$69.95**
9644M 13.1-ft. (4-m)	EXN04M	**$79.95**

For more information, see p. 87.

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DTMF↔ASCII Converters

Add a Voice-Mail Menu System to Your PC with Our DTMF↔ASCII Converter.

- **Automatically answer incoming phone calls with preprogrammed messages.**
- **Access a PC from any touchtone phone.**

These DTMF↔ASCII converters turn your PC into an automated phone-answering system. Signals from a touchtone phone are converted to ASCII characters and sent to the PC's serial port. You choose which voice responses to program and send back out to the caller. Ideal for order entry, status inquiries, data access, and even remote-control applications.

DTMF↔ASCII Converter II (IC142A) provides eight slots in which you can record your own voice messages. The total length of all messages can be up to 48 seconds.

DTMF↔ASCII Converter III (IC142A-R2) has a standard vocabulary of 120 words and phrases that can be combined into messages with no time limit. Custom vocabularies are available.

EXCLUSIVE
BLACK BOX
DTMF↔ASCII CONVERTER III
DTMF
ASCII

SPECIFICATIONS

Speed — (8) switch-selectable rates from 1200 bps to 115.2 Kbps
Interface — RS-232, configured as DCE
Connectors — (1) DB25 female, (1) ¼" power jack, (1) ¼" speaker jack
Indicators — (4) LEDs: TX, RX, CTS, DTR
Power — 115 VAC, 60 Hz, at 700 mA
Size — 3.3"H x 8"W x 6.3"D (8.4 x 20.3 x 16 cm)
Weight — 4 lb. (1.8 kg)

Item	Code	Price
DTMF↔ASCII Converter II	IC142A	**$595.00**
DTMF↔ASCII Converter III	IC142A-R2	**$595.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.
Specify gender when ordering.

◆ ◆ ◆

RS-232→Keyboard Converter • Keyboard→RS-232 Converter

Now Your PC Can Receive Data from Any RS-232 Device!

EXCLUSIVE

Keyboard
232
232
Keyboard
BLACK BOX®
RS232
SW2

- **Convert between PC keyboard signals and any RS-232 device.**
- **Supports data rates to 76.8 Kbps.**

Enter data directly from any RS-232 device. Just attach the IC812A to your PC's keyboard, and the RS-232 input device. Translate either ASCII codes or 8-bit data bytes.

The IC813A translates keyboard signals to RS-232.

SPECIFICATIONS

Data Format — 7 or 8 data bits, switch-selectable
Speed — 76.8 Kbps
CE Approval — IC812A, 230-VAC version: IC813AE
Interface — IC812A: 232→ASCII; IC813A: ASCII→232
Connectors — (2) 6-pin DIN female, (1) DB25 female
Power — IC812A: From PC; IC813A: From RS-232 device
Size — 1.5"H x 5"W x 5"D (3.8 x 12.7 x 12.7 cm)
Weight — 0.6 lb. (0.3 kg)

Item	Code	Price
RS-232→Keyboard Converter	IC812A	**$179.00**
Keyboard→RS-232 Converter	IC813A	**$236.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.
Specify gender when ordering.

High-Speed Async to Sync Interface Converter

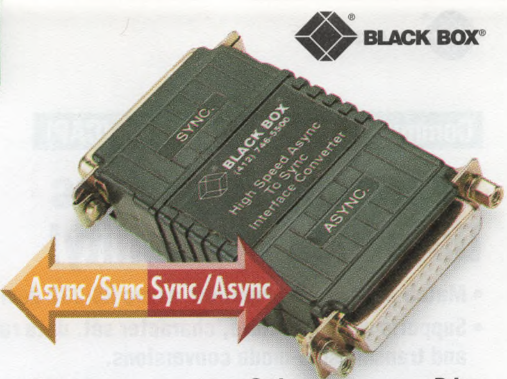
Don't Retire Your Expensive Sync Modems and Muxes. Two of These Converters Give Them New Life!

- Speeds from 19.2 to 64 Kbps.
- Convert async DTE signals for transmission via sync modems or muxes.
- Use point to point or multipoint.
- Conforms to V.22 and V.14 standards.
- Automatically adjusts sync data rates.

FAXBACK INFORMATION
Request Document Number: 14113
Call 412-746-5500 Anytime

SPECIFICATIONS

Buffer — 4-bit override empties buffers before dropping RTS for use in a polling environment
Clocking — External from modem or multiplexor
Operation — Half- or full-duplex
CE Approval — Yes
Interface — RS-232
Connectors — Async: (1) DB25F; Sync: (1) DB25M
Power — From connected sync or async device
Size — 0.8"H x 2"W x 3.2"D (2 x 5.1 x 8.1 cm)
Weight — 0.1 lb. (<0.1 kg)



Item	Code	Price
High-Speed Async to Sync Interface Converter	IC558A	**$325.00**
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

remember to order **cables**

For other lengths, see p. 83.
Specify gender when ordering.

◆ ◆ ◆

Async to Sync Interface IV • Micro Sync to Async Converter (MSAC)

Link Async Hardware with Your Existing Sync Modems and Muxes.

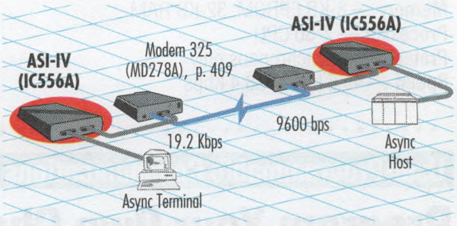
IC942A
ASI-NPR
Async/Sync
Sync/Async
ASI-IV
SYNC
ASYNC
RD TD TC RC RD TD PWR
BLACK BOX
IC556A

- **Convert async DTE signals for transmission over sync data lines.**
- **Two models handle a range of conversions, dialup or leased lines, or modem standards.**

Use the sync modems and muxes you already own to link async terminals, printers—even midrange hosts—with a pair of these Converters.

Async/Sync Interface IV—Works in half- or full-duplex mode. Links RS-232 interfaces in point-to-point applications. Digital loopback tests check signals; a sync bypass finds problem sources.

Micro Sync to Async Converter (MSAC)—Handles data rates from 150 bps to 19.2 Kbps. Switch-selects character length from 8 to 11 bits. IC942A converts data bit by bit. Its no-buffer delay is best suited for large file-transfers. IC932A has an elastic buffer for interactive host communications.



SPECIFICATIONS

Async to Sync Interface IV:
Flow Control — User-selectable: Transparent or continually asserting RTS, DTR, DCD, and DSR
Leads Supported — Sync port: 1–8, 15, 17, 20, 23; Async port: 1–8, 20
Maximum Distance — 50 ft. (15.2 m)
Speed — 600 bps to 19.2 Kbps
Connectors — DTE: (1) DB25 female (async); DCE: (1) DB25 male (sync)
Power — 115 VAC/60 Hz, 200 mA
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)

Micro Sync to Async Converter:
Maximum Distance — 50 ft. (15.2 m)
Operation — Half- or full-duplex
Speed — 150 bps to 19.2 Kbps, strap-selectable
CE Approval — IC942A
Interface — RS-232
Connectors — IC942A: (2) DB25 male (sync, always male; async, select male or female); IC932A: (2) DB25 female
Power — From the connected devices
Size — 0.9"H x 1.8"W x 4.7"D (2.3 x 4.6 x 12 cm)

Item	Code	Price
Async/Sync Interface IV	IC556A	**$245.00**
Micro Sync to Async Converter (MSAC)		
Male	IC942A-M	**$255.00**
Female	IC942A-F	**$255.00**
Female with Elastic Buffer (No Cable Included)	IC932A	**$255.00**
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

remember to order **cables**

For other lengths, see p. 83.
Specify gender when ordering.

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BCD→ASCII Converter

Send Binary-Coded Data (BCD) to Any ASCII Device.

BCD ASCII

- Instantly converts up to five BCD digits into ASCII.
- Use your PC or printer to retrieve the Converter's stored data.
- View BCD/hex-code as ASCII.
- 8-KB buffer.
- Software/hardware handshaking.

BLACK BOX
BCD→ASCII
INTERFACE CONVERTER
RESET
POWER

FAXBACK INFORMATION
Request Document Number: 11440
Call 412-746-5500 Anytime

Item	Code	Price
BCD→ASCII Converter	IC031A	**$385.00**
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
DB37 Interface Cable, 10-ft. (3.0-m)	EDN37J-0010-FF	**$43.95**

remember to order **cables**

For other lengths, see p. 83.
Specify gender when ordering.
For other lengths or genders, see p. 110.

Communications Adapter Plus (CAP)

Overcome *Any* Async Data Incompatibility!

DTR/CTS to X-ON/X-OFF... 45 bps to 38.4 Kbps... half-duplex to full-duplex...

CAP
RESET
TXA RXA TXB RXB
PWR
BLACK BOX

- **Match *any* two incompatible async RS-232 devices.**
- **Supports word structure, character set, data rate, and transmission-mode conversions.**
- **Supports hardware or software buffer flow control.**

You can make any two of your async serial devices communicate. Just use the Communications Adapter Plus (CAP) from Black Box. It can translate between any two mutually unintelligible protocols.

Configure CAP's two RS-232 ports individually via DIP switches for the greatest conversion flexibility you'll find anywhere.

CAP converts word structure (number of data bits, parity, and stop bits), character sets (ASCII, EBCDIC, Baudot, transcode, and ticker tape), and flow control (DTR/CTS, X-ON/X-OFF, ENQ/ACK), bidirectionally between half- and full-duplex, and speeds from 45.5 bps to 38.4 Kbps. The flow-control buffer is 32 KB, enabling even slow machines to talk to fast ones.

FAXBACK INFORMATION
Request Document Number: 11251
Call 412-746-5500 Anytime

Item	Code	Price
Communications Adapter Plus (CAP)		
Standalone	CMA02A	**$305.00**
Rackmount Card	CMA02C	**$275.00**
12-Card Rack for CAP	RM010-CAP	**$330.00**

SPECIFICATIONS

Controls — Front-panel Reset
Flow Control — Hardware, X-ON/X-OFF, ENQ/ACK, DTR/CTS
Memory — 8-KB EPROM, 32-KB RAM
Processor — Z-80 CPU
Protocol — Asynchronous only
Speed — 45.5 bps to 38.4 Kbps
CE Approval — All items listed are approved
Interface — RS-232, configured as DTE
Connectors — (2) DB9 female
Power — 115 VAC, 60 Hz, 95 mA, 11 watts; 230 VAC, 50 Hz, 48 mA, 11 watts
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)
Weight — 2 lb. (0.9 kg)

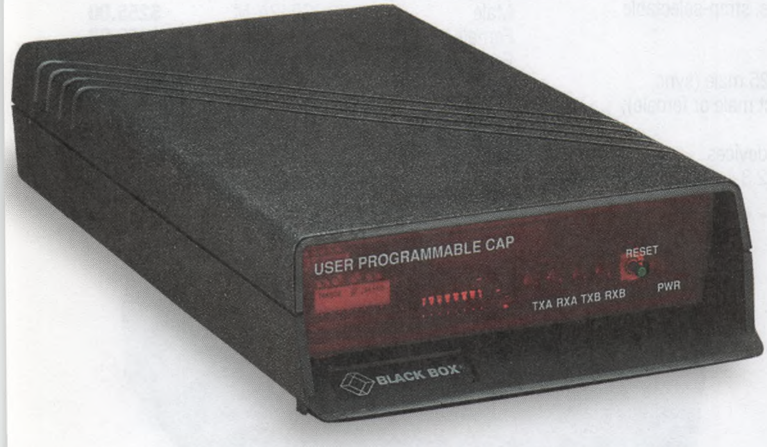
remember to order cables

Item	Code	Price
9-Pin to DTE Cable (DB25 Male)	EHM023-0010	**$21.05**
9-Pin to Modem Cable (DB25 Male)	EHM024-0010	**$21.05**
9-Pin to AT® Cable (DB9 Female)	EHM025-0010	**$18.30**
9-Pin to PC Cable (DB25 Female)	EHM026-0010	**$21.05**

◆ ◆ ◆

User-Programmable Communications Adapter Plus

Program Your Own Character/ Character-String Conversions.



- **Program your own custom conversions.**
- **Store and modify your custom translation table on the User-Programmable CAP or on your PC.**
- **Download the same translation table to any number of User-Programmable CAPs—for programming without flipping a DIP switch.**

With the BLACK BOX® User-Programmable CAP, you get the flexibility to create your own custom conversion programs—again and again. You can use just one User-Programmable CAP for any number of single- or multiple-character conversions. Store your programs in the 8-KB nonvolatile RAM, or upload or download them to or from your PC for storage, editing, or further downloading to as many User-Programmable CAPs as you need.

It's perfect for any application in which you need to change a character or string. Convert the control sequence between your PC and printer when you need to change fonts. Program it to remove control-character sequences inserted into wire-service feeds, such as from API—and more!

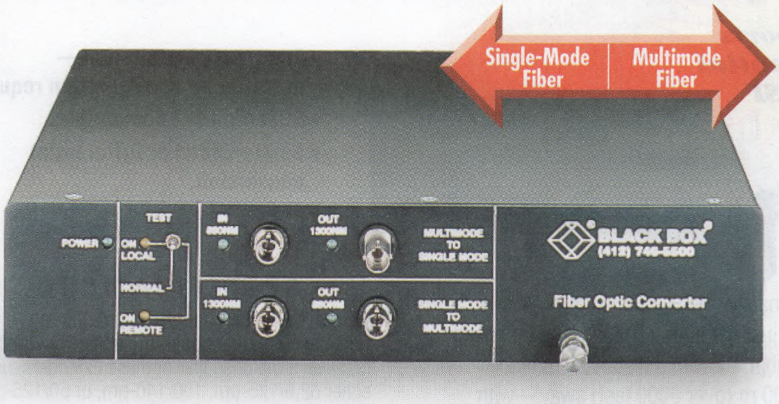
SPECIFICATIONS

Controls — Reset
Memory — 32-KB RAM
Protocol — Async only
Speed — 45.5 bps to 38.4 Kbps
Translations — Maximum memory available for translations, 8 KB; Match strings or substitution strings: up to 256 bytes each
CE Approval — All items listed are approved
Connectors — (2) DB9 female DTE
Power — 115 VAC, 60 Hz, 95 mA, 11 watts
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)
Weight — 2 lb. (0.9 kg)

Item	Code	Price
User-Programmable CAP		
Standalone	CMA005A	**$450.00**
Rackmount Card	CMA005C	**$420.00**
12-Card Rack for CAP	RM010-CAP	**$330.00**

Fiber Optic Converter

Combine Single-Mode and Multimode Fiber in One Run for Longer, Cleaner Transmissions.

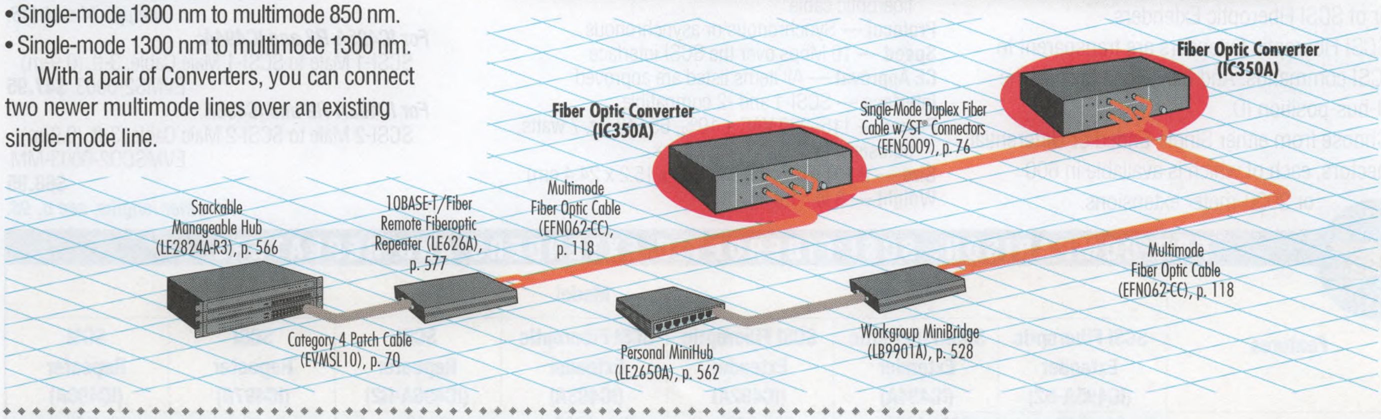

Single-Mode Fiber
Multimode Fiber
POWER
TEST
ON LOCAL
NORMAL
ON REMOTE
IN 850NM
OUT 1300NM
MULTIMODE TO SINGLE MODE
IN 1300NM
OUT 850NM
SINGLE MODE TO MULTIMODE
BLACK BOX (412) 746-5500
Fiber Optic Converter

- **Transparent conversion of fiberoptic signals: 850 nm to 1300 nm, single mode to multimode.**
- **Supports Ethernet, Token Ring, FDDI and ATM.**
- **Data rates up to 155 Mbps.**
- **Loopback diagnostics are included.**

With this Converter, you can connect your single-mode fiber line to a multimode fiber line.

The Converter gives you system flexibility. Use it for these transparent conversions:
- Single-mode 1300 nm to multimode 850 nm.
- Single-mode 1300 nm to multimode 1300 nm.

With a pair of Converters, you can connect two newer multimode lines over an existing single-mode line.


Fiber Optic Converter (IC350A)
Fiber Optic Converter (IC350A)
Single-Mode Duplex Fiber Cable w/ST® Connectors (EFN5009), p. 76
Multimode Fiber Optic Cable (EFN062-CC), p. 118
10BASE-T/Fiber Remote Fiberoptic Repeater (LE626A), p. 577
Stackable Manageable Hub (LE2824A-R3), p. 566
Category 4 Patch Cable (EVMSL10), p. 70
Personal MiniHub (LE2650A), p. 562
Workgroup MiniBridge (LB9901A), p. 528
Multimode Fiber Optic Cable (EFN062-CC), p. 118

remember to order **cables**

Superior Quality Fiber Optic Cable for Your Fiber Optic Converter.

Single-Mode Fiber Optic Cable

- **Higher transmission rate than multimode fiber.**
- **8.5-µm fiber core.**
- **OFNR NEC® rating.**
- **100% tested.**

Increase your throughput and get up to 50 times more distance than multimode fiber with our new Single-Mode Duplex Fiber Optic Cable. These Cables are ideal for duplex riser applications within buildings. Because wavelength interference is eliminated, you can increase the distance between your Fiber Optic Converters (**above**) or other equipment such as repeaters. These cables are secure, too, so they can't be tampered with or have data taps installed. And you can install these Cables safely with other fiber and/or copper cables without worrying about crosstalk.

Item	Code	Price
Single-Mode Duplex Fiber Optic Cable, PVC		
ST-ST 1-m	EFN5009-001M	**$149.95**
Custom Lengths	EFN5009	**$159.95 + 8.95/m**

Multimode Fiber Optic Cable

- **Near-unlimited bandwidth at high speeds over long distances.**
- **Totally immune to electrical interference.**
- **62-µm fiber core.**
- **100% tested.**

Run this Cable from your Fiber Optic Converters (**above**) to your repeaters and other network equipment. You'll get almost unlimited bandwidth at high speeds—and over long distances. And you can run this Cable to the desktop for high-data-rate system such as FDDI, multimedia, or ATM (Asynchronous Transfer Mode)—any application that requires the transfer of large network-time-consuming files.

Item	Code	Price
Multimode Fiber Optic Cable ST-ST Duplex Riser		
1-m (3.2-ft.)	EFN062-001M-CC	**$69.95**
Custom Lengths	EFN062-CC	**$79.95 + $.70/ft.**

SPECIFICATIONS

Diagnostics — Local or remote loopback
Protocol — Supported: Ethernet (10BASE-FL, FOIRL), FDDI (ANSI X3T9.5), Token Ring (IEEE 802.5J), ATM (OC-1, SONET, TAXI, OC-3, STM-1)
Speed — 100 Kbps to 155 Mbps (multilevel optical codes and uncoded signals not supported)
CE Approval — All items listed are approved
Interface — Multimode optical; single-mode optical
Connectors — ST®
Indicators — Power, Test On, Mode Selector, Remote Test, (4) Connector
Power — 90–260 VAC, 47–63 Hz, 6 W
Size — 1.7"H x 8.5"W x 9.5"D (4.3 x 21.6 x 24.1 cm)
Weight — 2.4 lb. (1.1 kg)

FAXBACK INFORMATION
Request Document Number: 14106
Call 412-746-5500 Anytime

Item	Code	Price
Fiber Optic Converter		
850 nm	IC350A	**$2500.00**
1300 nm	IC351A	**$2800.00**

SCSI Fiberoptic Extenders

Dynamite SCSI's Distance Barrier—from 6 Meters to as Much as 2000 Meters!

Supports Differential SCSI
BLACK BOX®
SCSI FIBER OPTIC EXTENDER
LINK ACTIVE
BUS ACTIVE
LINK ERROR
POWER

Unfortunately, the SCSI bus limits cable distance to just 6 meters (20 feet). But you need more than that. Blow that distance limitation away—2000 m (over 6000 feet) away—with a pair of SCSI Fiberoptic Extenders.

SCSI Fiberoptic Extenders are transparent to all SCSI commands. And they won't take up the SCSI-bus-position ID.

Choose from either Single-Ended or Differential connectors, each of which is available in 600 or 2000-meter extensions.

- **Fast, easy installation—no software configuration required.**
- **SCSI-1 and -2 compatible.**
- **Single-Ended or Differential conversion.**

SPECIFICATIONS

Maximum Cable Length — 600 or 2000 m (depending on the model) of duplex fiberoptic cable between a matched pair of these Extenders; use either 62.5/125-µm, 100/140-µm, or 50/125-µm fiberoptic cable
Protocol — Synchronous or asynchronous
Speed — 10 Mbps over the SCSI interface
CE Approval — All items listed are approved
Interface — SCSI-1 and -2 compatible
Power — 115–230 VAC ± 10%, 65–48 Hz, 7 watts, autosensing
Size — 2.1"H x 6"W x 9.6"D (5.3 x 15.2 x 24.4 cm)
Weight — 3 lb. (1.4 kg)

Item	Code	Price
SCSI Fiberoptic Extenders, Single-Ended		
50-Pin Centronics®		
600-m (1968-ft.)	IC495A-R2	**$1495.00**
2000-m (6561-ft.)	IC494A	**$1695.00**
SCSI Fiberoptic Extenders, Differential		
50-Pin High-Density		
600-m (1968-ft.)	IC492A	**$1995.00**
2000-m (6561-ft.)	IC493A	**$2195.00**

remember to order cables

Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific lengths or bulk cable, see pp. 74 and 118.

For IC495A-R2 and IC494A:

SCSI-1 Male to SCSI-1 Male Cable, 3-ft. (0.9-m)	EVMS2-0003	**$47.95**

For IC492A-R2 and IC493A:

SCSI-2 Male to SCSI-2 Male Cable, 3-ft. (0.9-m)	EVMSCO2-0003-MM	**$68.95**

For other lengths, see p. 98.

FOR COMPARISON: SCSI FIBEROPTIC EXTENDERS AND REPEATERS

Features	Model						
	SCSI Fiberoptic Extender (IC495A-R2)	SCSI Fiberoptic Extender (IC494A)	SCSI Fiberoptic Extender (IC492A)	SCSI Fiberoptic Extender (IC493A)	SCSI Repeater (IC496A-R2)	SCSI Repeater (IC497A)	SCSI Repeater (IC498A)
Distance	30–600 m	600–1800 m	30–600 m	600–1800 m	6–18 m	6–18 m	6–12 m
Single-Ended	✓	✓			✓	✓	✓
Differential			✓	✓			
Narrow	✓	✓	✓	✓	✓	✓	
Wide							✓
Connector	Centronics 50-Pin	Centronics 50-Pin	50-Pin HD	50-Pin HD	Centronics 50-Pin	50-Pin HD	68-Pin
Daisychain	Use in Pairs	Use in Pairs	Use in Pairs	Use in Pairs	Up to 3	Up to 3	Up to 2

SCSI Repeaters

Why Limit Yourself?
Take SCSI beyond the Six-Meter Limit!

- **Extend the SCSI bus from 6 to 12 m. Or install three Repeaters for a total bus length of 24 m! For more distance, see the Fiberoptic Extenders (above).**
- **Support Single-Ended Narrow and Wide SCSI.**
- **Compatible with SCSI-1, -2, and -3.**

Get additional cable distance! BLACK BOX® SCSI Repeaters clean, regenerate, and boost your SCSI bus signal—so you can break past that annoying 6-meter bus limit.

Our SCSI Repeaters eliminate system crashes caused by poor-quality SCSI cables or noisy peripherals. They support Single-Ended Narrow and Wide devices.

Compatible with SCSI-1, -2, and-3, the SCSI Repeaters support the Ultra SCSI data rate—up to 40 MBps.

SPECIFICATIONS

Maximum Cable Length — IC496A-R2, IC497A:
1.5 m (4.9 ft.) at 20 MBps to 6 m (19.7 ft.) at 5 MBps, with three units on bus: 6 m (19.7 ft.) at 20 MBps to 24 m (78.7 ft) at 5 MBps;
IC498A: 1.5 m (4.9 ft.) at 40 MBps to 6 m (19.7 ft.) at 10 MBps, with three units on bus: 6 m (19.7 ft.) at 40 MBps to 24 m (78.7 ft) at 10 MBps
Protocol — Synchronous or asynchronous
CE Approval — 230-VAC versions: IC496AE-R2, IC497AE–IC498AE
Interface — All: Single-ended; IC496A-R2, IC497A: Narrow SCSI; IC498A: Wide SCSI
Connectors — All: (1) 5-pin mini-DIN F;
IC496A-R2: (2) 50-pin Centronics female;
IC497A: (2) 50-pin high-density F;
IC498A: (2) 68-pin high-density F
Power — 115 VAC, 60 Hz, wallmount power supply
Size — 1.1"H x 3.4"W x 4.7"D (2.8 x 8.6 x 11.9 cm)
Weight — 1 lb. (0.5 kg)

BLACK BOX
(412) 746-5500
SCSI REPEATER
Supports Ultra SCSI

Item	Code	Price
SCSI Repeaters (Single-Ended)		
Narrow 50-Pin Centronics	IC496A-R2	**$295.00**
50-Pin High-Density	IC497A	**$295.00**
Wide 68-Pin High-Density	IC498A	**$395.00**

remember to order cables

For IC496A-R2:

SCSI-1 Male to SCSI-1 Male Cable, 3-ft. (0.9-m)	EVMS2-0003	**$47.95**

For IC497A:

SCSI-2 Male to SCSI-2 Male Cable, 3-ft. (0.9-m)	EVMSCO1-0003-MM	**$74.95**

For IC497A:

SCSI-3 Male to SCSI-3 Male Cable, 3-ft. (0.9-m)	EVNSCO7-0003	**$125.00**

For other lengths, see pp. 98–99.

SCSI Differential Converters

Convert between Single-Ended and Differential SCSI...and Extend the SCSI Bus.

SCSI Differential Converter
POWER
BUS ACTIVE
BLACK BOX
(412) 746-5500
Single
Differential
SINGLE-ENDED PORT
DIFFERENTIAL PORT
SCSI DIFFERENTIAL
MODEL ACI-1000

Top: Front view, IC124A; Bottom: Rear view, IC124A

FAXBACK INFORMATION
Request Document Number: 16218
Call 412-746-5500 Anytime

- **Convert Single-Ended SCSI to Differential or vice versa.**
- **Extend the SCSI Bus to 36 meters.**
- **Supports SCSI-1, -2, and -3.**

Two functions in a single package—that's what you get with our new SCSI Differential Converter.

This SCSI Converter is a high-performance device that translates Single-Ended SCSI bus signals into Differential signals or vice versa.

You can also interconnect two of the units and use them as a Single-Ended to Single-Ended bus extender for a maximum overall bus length of 36 m (120 ft.).

The SCSI Differential Converter supports a maximum data rate of 10 megabytes per second (MBps) in synchronous mode, or up to 5 MBps in asynchronous mode.

It's completely transparent to all SCSI-1 and 8-bit SCSI-2 commands and doesn't require a SCSI device address. So you can install it anywhere you need it on the SCSI bus to provide precisely the kind of conversion you need.

SPECIFICATIONS

Maximum Cable Length —
Single-Ended Port: 6 m (19.7 ft.) @ 5 MBps;
Differential Port: 25 m (82 ft.)
Speed — Up to 10 MBps
(with a conversion delay of 30 ns)
CE Approval — 230-VAC versions: IC124AE, IC125AE
Connectors — IC124A: 50-pin Centronics® female, 50-pin HD female;
IC125A: 68-pin HD female
Power — 115/230 VAC, 60/50 Hz
Size — 2.1"H x 6"W x 9.5"D (5.3 x 15.2 x 24.4 cm)
Weight — 2.5 lb. (1 kg)

Item	Code	Price
SCSI Differential Converters		
Narrow	IC124A	**$695.00**
Wide	IC125A	**$995.00**

remember to order cables

For IC124A:		
SCSI-1 Male to SCSI-1 Male Cable, 3-ft. (0.9-m)	EVMS2-0003	**$47.95**
For IC125A:		
SCSI-3 Male to SCSI-3 Male Cable, 3-ft. (0.9-m)	EVNSC07-0003	**$125.00**

For other lengths of these SCSI cables, see pp. 98–99.

◆ ◆ ◆

Parallel-to-SCSI Converter

Connect SCSI Peripherals via Parallel Ports.

- **Connect up to six SCSI peripherals to your PC's enhanced parallel port.**
- **Easy-to-use software supports CD-ROMs, hard drives, scanners, tape backups, and much more.**
- **Fast! It moves data at up to 1 Mbps.**
- **Printer pass-through port so you can use your printer simultaneously.**

Connect this Converter to your enhanced parallel port (EPP) and get a supercharged SCSI interface that can move data up to 1 Mbps. With a standard parallel port, you can still transfer data at 300,000 characters per second. And your printer stays connected with a second parallel connector.

SPECIFICATIONS

Speed — Enhanced parallel port: 1 Mbps;
Standard port: 300 Kbps
Termination — Built-in
CE Approval — 230-VAC version: IC801AE
Connectors — (1) DB25 male, (1) DB25 female, (1) 50-pin Centronics male at end of 33-in. cable
Power — 115-VAC, 60-Hz wallmount power supply (230-VAC, 50-Hz version on request)
Size — 0.9"H x 3"W x 2.8"D (2.3 x 7.6 x 7.1 cm)

Item	Code	Price
Parallel-to-SCSI Converter	IC801A	**$230.00**

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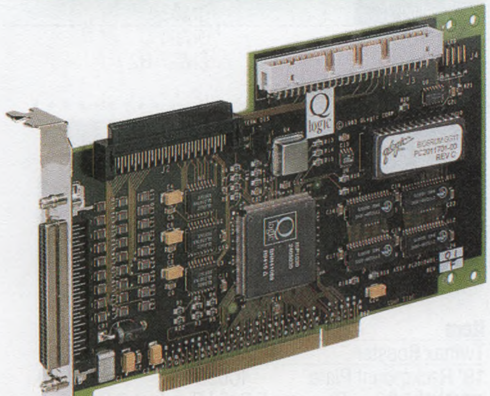
PCI Fast SCSI Host Adapter Card

Add High-Performance SCSI to Your PC.



- **Software included.**
- **Compatible with most operating systems.**
- **Support for up to 15 SCSI devices.**
- **For your PC's PCI bus.**

This high-performance 20-MBps Adapter is perfect for a server environment—you can use it as a primary controller.

The Adapter has a RISC chip to lessen the load on the host PC. It has 10- and 20-MBps (Fast and Wide) SCSI capability and uses PCI's 32-bit, 132-Mbps speed for low bus latency.

A large driver ensures optimal performance in most operating environments.

SPECIFICATIONS

FIFO — 64-byte DMA per channel with threshold control
RAM — 256 bytes, on-chip static
SCSI Standard — ANSI X3T9.2 SCSI-2
CE Approval — Yes
Connectors — (1) 68-pin high-density external, (1) 68-pin internal with 50-pin internal ribbon connector

Item	Code	Price
PCI Fast SCSI Host Adapter Card	IC404C	**$549.00**

remember to order cables

SCSI-3 Male to SCSI-3 Male Cable, 3-ft. (0.9-m)	EVNSC07-0003	**$125.00**

Your Total AS/400 and 3X

Twinmux Repeaters (8-Port)

Link 40 AS/400 Workstations— over One UTP or Fiber Cable Pair!

BLACK BOX®
TWINMUX REPEATER

- **Send data up to a total of 6500 feet (1980 m) using a pair of UTP Twinmuxes.**
- **Or route data up to a maximum of 12200 feet (3719 m) with two fiber models.**
- **Install a Multiple Twinax Repeater III on the remote side to add an extra 2500 feet (760 m) to your total cable distance.**
- **Multiplexes/demultiplexes up to eight ports over one fiber or UTP cable.**
- **Backup link keeps data flowing even if the primary link goes down.**

Your entire site can go the extra distance with BLACK BOX® Twinmux Repeaters. Two Twinmux Repeaters can link up to forty AS/400® workstations over a single cable pair!

The Twinmux Repeater saves you money, too. Each workstation connects to the Repeater over inexpensive UTP cable. (You'll also need baluns so see our selection on the **next page**.)

And your connection is reliable. The Twinmux Repeater restores signal timing, amplitude, and frame data damaged by other peripherals—another way Black Box helps you go the distance.

SPECIFICATIONS

Cable Requirements — UTP: 24 AWG or lower, solid copper, unshielded twisted pair; Fiber: Dual fiber, multimode graded index
Maximum Distance — Host to Twinmux Repeater or Repeater to device: Up to 2000 ft. (610 m); Composite distance: 2500 ft. (760 m) with Category 3 UTP, 8200 ft. (2500 m) with fiber
CE Approval — 230-VAC versions: IC090AE-R2–IC091AE-R2
Connectors — UTP: (10) RJ-45; Fiber: (8) RJ-45, (4) ST®
Power — 115 VAC/12 VDC @ 1.0 A; 230 VAC/9 VDC @ 1.2 A
Size — UTP: 1.8"H x 19"W x 4"D (4.6 x 48.3 x 10.2 cm); Fiber: 1.8"H x 19"W x 4.5"D (4.6 x 48.3 x 11.4 cm)
Weight — 3.6 lb. (1.6 kg)

Item	Code	Price
Twinmux Repeaters (8-Port)		
UTP	IC090A	**$1500.00**
Fiber	IC091A	**$2000.00**

remember to order cables

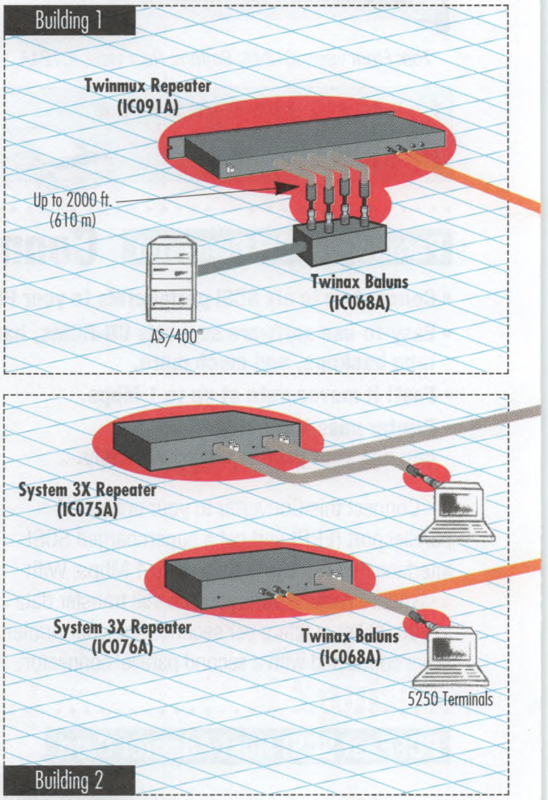
Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned		
PVC	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

For IC091A, you'll also need:

Bulk Duplex Fiber Optic Cable, PVC		
ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific lengths or bulk cable, see pp. 74 and 118.



* * *

System 3X Repeaters

Double Your Distance without Doubling the Noise!

BLACK BOX®
BLACK BOX®

- One pair amplifies data for long-distance transmission.
- Sends data from an AS/400 or S/3X host to remote terminals: almost a mile with UTP and over 1½ miles with fiber.
- Filters signals, reapplies sync bits, and ensures proper packet size.

SPECIFICATIONS

Maximum Distance — IC052, IC075A: 4500 ft. (1372 m) UTP; IC053, IC076A: 4500 ft. (1372 m) UTP; 8200 ft. (2500 m) fiber
CE Approval — 230-VAC versions: IC075AE–IC076AE
Connectors — IC052: (2) RJ-11, (2) 2-screw blocks; IC053: (1) RJ-11, (1) 2-screw block, (2) ST; IC075A: (2) RJ-45, (2) 2-screw blocks; IC076A: (1) RJ-45, (1) 2-screw block, (2) ST
Power — 115-VAC power supply, wallmount transformer

Item		Code	Price
System 3X Repeater			
RJ-11	UTP	IC052	**$615.00**
	Fiber	IC053	**$770.00**
RJ-45	UTP	IC075A	**$615.00**
	Fiber	IC076A	**$770.00**
19" Rackmount Plate		IC055	**$52.00**

remember to order cables

For fiber models:

Bulk Duplex Fiber Optic Cable, PVC,		
ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific lengths or bulk cable, see pp. 74 and 118.

* * *

Twinax Booster

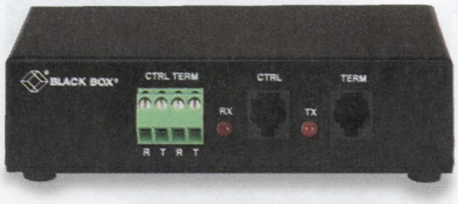
Give Your Baluns a Boost— up to 4500 Feet.

- **Sends S/3X or AS/400 transmissions 4500 feet (1372 m) over twisted-pair cable.**

Install this Booster in the middle of your cable run to add 4500 extra feet to a twinax cable run. If you need to connect more than one device, then order the Multiple Twinax Repeater III, on the **facing page**.

SPECIFICATIONS

Cable Requirements — Low-capacitance unshielded twisted pair, Category 3, 4, and 5
Leads Supported — Pins 3 and 4
Maximum Distance — 4500 ft. (1372 m)
Connectors — (2) RJ-11, (1) 4-screw terminal block
Power — 115 VAC (230-VAC version on request)
Size — 1.4"H x 5.4"W x 3.2"D (3.6 x 13.7 x 8.1 cm)
Weight — 1 lb. (2.2 kg)



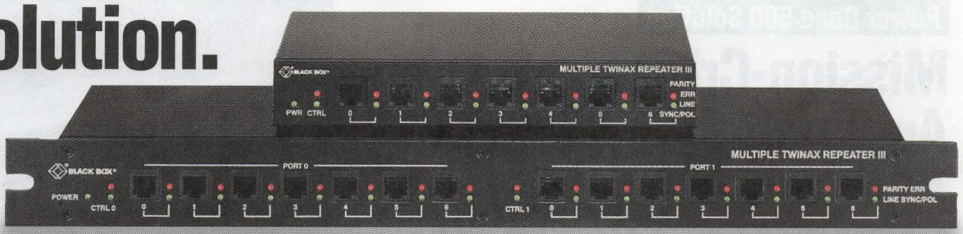
Item	Code	Price
Twinax Booster	IC022A	**$380.00**
19" Rackmount Plate	IC055	**$52.00**

remember to order cables

Category 5 Solid Conductor Cable, 2-Pair, Bulk		
PVC	EYN717A	**$.15/ft.**

For plenum applications, see p. 115.

Connectivity Solution.


BLACK BOX®
MULTIPLE TWINAX REPEATER III
PWR CTRL
PARITY
ERR
LINE
SYNC/POL
BLACK BOX®
PORT 0
PORT 1
POWER
CTRL 0
CTRL 1
MULTIPLE TWINAX REPEATER III
PARITY ERR
LINE SYNC/POL

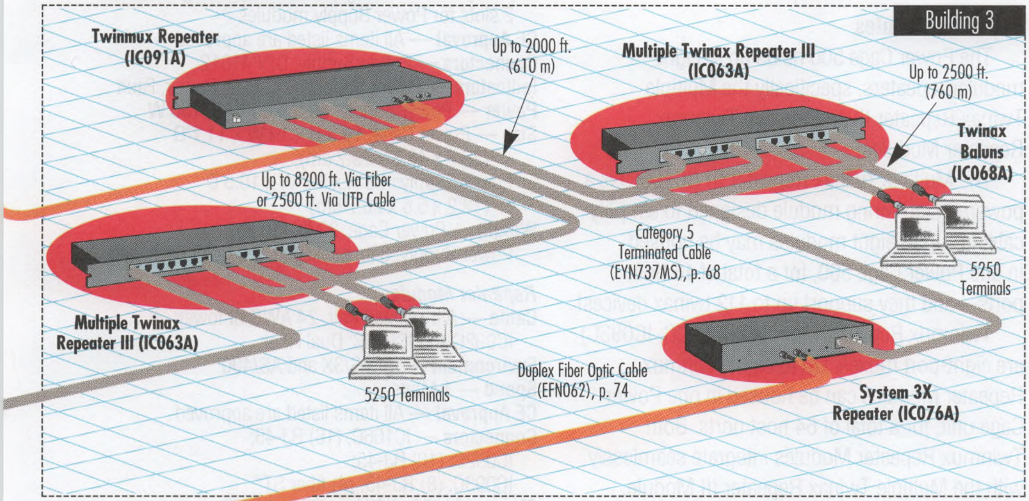
Multiple Twinax Repeater III

Shoot Clean Twinax Signals 4500 Feet!

- **Sends signals up to a maximum of 4500 feet (1372 m) via UTP cable: up to 2000 ft. on the host or Twinmux Repeater side; up to 2500 ft. on the device side.**
- **Reformats and filters noise from signals.**

Black Box brings you even more connectivity flexibility—intelligent powered hubs for your AS/400® or System 36/38. The Multiple Twinax Repeater III has timing and pulse-duty-cycle correction to reduce jitter and superior crosstalk rejection to reduce internal signal noise. That means you can daisychain other active devices for increased cabling flexibility and extended configurations.

It's convenient, too. Check system status at a glance. Each Multiple Twinax Repeater III port has two LEDs, one for Line Sync/Polarity and the other for Parity Error so you're instantly updated on Repeater and twinax line status.


Building 3
Twinmux Repeater (IC091A)
Up to 2000 ft. (610 m)
Multiple Twinax Repeater III (IC063A)
Up to 2500 ft. (760 m)
Twinax Baluns (IC068A)
Up to 8200 ft. Via Fiber or 2500 ft. Via UTP Cable
Category 5 Terminated Cable (EYN737MS), p. 68
5250 Terminals
Multiple Twinax Repeater III (IC063A)
5250 Terminals
Duplex Fiber Optic Cable (EFN062), p. 74
System 3X Repeater (IC076A)

SPECIFICATIONS

Cable Requirements — 24 AWG or lower, solid copper, unshielded twisted pair

Leads Supported — IC060A, IC062A: 3, 4 (USOC); IC061A, IC063A: 1, 2 (AT&T®, PDS); other pinnings configurable by internal jumpers

Maximum Distance — To host: 2000 ft. (610 m); to device: 2500 ft. (760 m)

Speed — 1 Mbps

CE Approval — 230-VAC versions: IC061AE-R2, IC063AE-R2

Connectors — IC060A: (8) RJ-11; IC061A: (8) RJ-45; IC062A: (16) RJ-11; IC063A: (16) RJ-45

Power — 115 or 230 VAC

Size — IC060A, IC061A: 1.4"H x 8.5"W x 4"D (3.6 x 21.6 x 10.2 cm); IC062A, IC063A: 1.8"H x 19"W x 4"D (4.6 x 48.3 x 10.2 cm)

Weight — IC060A–IC061A: 2 lb. (0.9 kg); IC062A–IC063A: 4 lb. (1.8 kg)

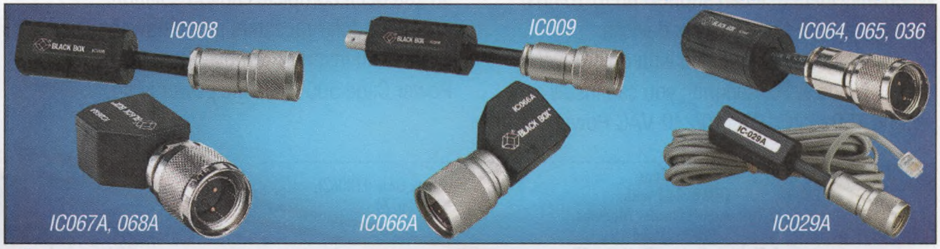
Item	Code	Price
Multiple Twinax Repeater III		
7-Port RJ-11	IC060A	**$550.00**
RJ-45	IC061A	**$550.00**
14-Port RJ-11	IC062A	**$1050.00**
RJ-45	IC063A	**$1050.00**
19" Rackmount Plate	IC055	**$52.00**
remember to order **cables** Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned		
PVC	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		
Category 5 Solid Conductor Cable, 2-Pair, Bulk		
PVC	EYN717A	**$.15/ft.**
For plenum applications, see p. 115.		

Twinax Baluns

Twinax Equipment and Twisted-Pair Wiring? No Problem!

ABSOLUTELY GUARANTEED FOR LIFE

- Hermetically sealed against moisture and humidity.
- Built to endure tough working conditions.
- Guaranteed for life.
- Fully compliant with FCC and CSA regulations.


IC008
IC009
IC064, 065, 036
IC067A, 068A
IC066A
IC029A

BUYER'S GUIDE

TWINAX BALUNS

Item	Connectors	Leads Supported	Code	Price
Twinax↔Twisted Pair†	(1) Twinax male, (1) RJ-11 female (1) 2-screw terminal block	3, 4	IC008	**$50.50**
Twinax↔Coax†	(1) Twinax male, (1) BNC female	N/A	IC009	**$61.00**
Twinax↔Twisted Pair/RJ-45, Pins 1 & 2†	(1) Twinax male, (1) RJ-45 female adapter	1, 2	IC064	**$49.00**
Twinax↔Twisted Pair/RJ-45, Pins 4 & 5†	(1) Twinax male, (1) RJ-45 female adapter	4, 5	IC065	**$49.00**
Mini Twinax↔Twisted Pair*	(1) Twinax male, (1) RJ-11 female	3, 4	IC066A	**$50.00**
Mini Twinax↔Twisted Pair*	(1) Twinax male, (1) RJ-45 female	4, 5	IC067A	**$50.00**
Mini Twinax↔Twisted Pair*	(1) Twinax male, (1) RJ-45 female	1, 2	IC068A	**$50.00**
Twinax RJ-11 with 15" cable†	(1) Twinax male, (1) RJ-11 male	3, 4	IC029A	**$57.00**
Twinax Balun II†‡	(1) Twinax male, (1) RJ-11 female	2, 5	IC036	**$50.50**

* Size: 2.3"H (5.8 cm). † Size: 1"W x 5"D (2.5 x 12.7 cm). ‡ The Twinax Balun II handles ROLM® data-switch applications.

Power Cage 500 Solution

Mission-Critical Applications? Manage AS/400, S/3X, and LAN/WAN Cabling *Better.*

- **Supports up to 112 twinax devices!**
- **Repeater-based UTP star-wiring system.**
- **Includes one Power Supply, plus eight expansion slots for hub modules.**
- **Install a second Power Supply for dual redundancy.**
- **Short-circuit protection on each hub module.**
- **Includes blank plates to cover unused expansion slots.**
- **Separate power cables for each Power Supply.**
- **Diagnostic LEDs for power status.**
- **Compact 6U (10.5") high enclosure.**
- **Adjustable mounting brackets for 19" rack.**

If you've had problems trying to make cabling neater and more reliable in your IBM® S/3X or AS/400® environment, here's your answer—the Power Cage 500 Solution!

Power Cage 500 is a versatile, eight-slot powered chassis that has the organization, reliability, and security you need. And it's easy to service.

Power Cage 500 supports up to eight hot-swappable cabling modules plus two dual-redundant, hot-swappable Power Supply Modules. When fully loaded, it can support up to 16 host ports for a total of 112 twinax devices.

The unit comes equipped with one Power Supply Module. For security, you can install a second 150-watt, 100/110/240-VAC Power Supply Module (PS601A). Both Power Supplies have their own power cords so separate power circuits can be used for dual redundancy. If the power fails on one of the circuits, the second Power Supply automatically takes over the load—without interruption.

Repeater Modules

The Power Cage 500 holds up to eight modular repeaters, specifically the Multiple Twinax Repeater III and the two Twinmux Repeater Modules.

The Multiple Twinax Repeater III (IC106C) is a powered star-wiring module designed to simplify cabling. Up to eight modules may be housed in one Power Cage 500, for a total of 16 host ports—and they support up to 112 twinax devices!

Twinmux Repeater Modules (IC092C, IC093C) are eight-port muxes. Up to eight Twinmux Repeater Modules can be housed in one Power Cage unit, for a total of 64 host ports. Both Twinmux Repeater Modules integrate seamlessly with the Multiple Twinax Repeater III Module, so you get a complete cabling solution.

All modular repeaters are hot-swappable, so you can insert or remove them from the Power Cage 500 while the power is on.

SPECIFICATIONS

Power Cage and Power Supply:

Capacity — Power Cage: 8 slots for cabling modules, 2 slots for Power Supply modules

CE Approval — All items listed are approved

Connectors — Power Supply: DIN 41612

Indicators — Power Supply: (2) LEDs: Power, Fault

Power — Power Supply: 80 to 260 VAC, 150 W

Size — Power Cage: 10.5"H x 19"W x 11.7"D (26.7 x 48.3 x 29.7 cm);
Power Supply: 4.8"H x 2.2"W x 10.5"D (12.2 x 5.6 x 26.7 cm)

Weight — Power Cage: 22 lb. (10 kg);
Power Supply: 3 lb. packaged, 2.9 lb. unpackaged

Repeater Modules:

Cable — All: Twisted Pair, 24 AWG or lower; IC092C and IC093C: Dual Fiber

Environment — IBM S/3X and AS/400

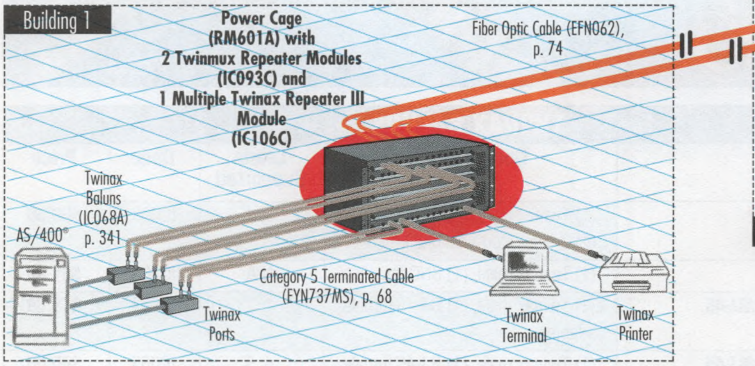
Speed — 1 Mbps

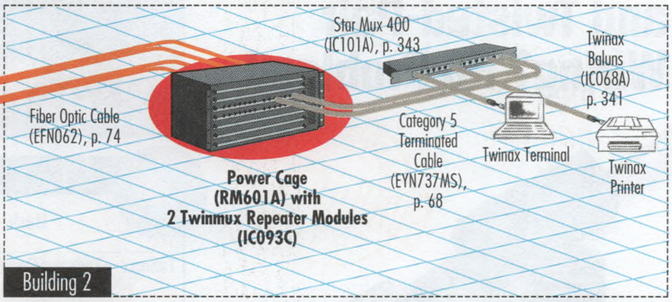
CE Approval — All items listed are approved

Connectors — IC106C: (16) RJ-45;
IC092C: (10) RJ-45;
IC093C: (8) RJ-45, (4) fiber ST®

Size — IC106C: 1.2"H x 15"W x 11.5"D (3.1 x 38.1 x 29.2 cm);
IC092C: 15"H x 1.2"W x 11.5"D (38.1 x 3.1 x 29.2 cm);
IC093C: 15"H x 1.2"W x 12"D (38.1 x 3.1 x 30.1 cm)

Weight — 2.1 lb. (0.9 kg)


Building 1
Power Cage (RM601A) with 2 Twinmux Repeater Modules (IC093C) and 1 Multiple Twinax Repeater III Module (IC106C)
Fiber Optic Cable (EFN062), p. 74
Twinax Baluns (IC068A) p. 341
AS/400®
Category 5 Terminated Cable (EYN737MS), p. 68
Twinax Ports
Twinax Terminal
Twinax Printer


Star Mux 400 (IC101A), p. 343
Twinax Baluns (IC068A) p. 341
Fiber Optic Cable (EFN062), p. 74
Category 5 Terminated Cable (EYN737MS), p. 68
Twinax Terminal
Twinax Printer
Power Cage (RM601A) with 2 Twinmux Repeater Modules (IC093C)
Building 2

FAXBACK INFORMATION
Request Document Number: 14120
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Item	**Code**	**Price**
Power Cage 500 Solution	RM601A	**$2700.00**
Repeater Modules		
Multiple Twinax III	IC106C	**$900.00**
8-Port Twinmux		
UTP Cable	IC092C	**$1200.00**
Fiber Cable	IC093C	**$1600.00**

Item	**Code**	**Price**
Power Supply	PS601A	**$800.00**
You may also need:		
Multiple Twinax Repeater III		**See page 341.**
Twinmux Repeaters		**See page 340.**

remember to order **cables**

Cat 5 Solid Conductor Cable, 4-Pair 10-ft. (3.0-m), Straight-Pinned EYN737MS-0010 **$10.95**

For the IC093C, you'll also need:

Bulk Duplex Fiber Optic Cable, PVC ST-ST EFN062-CC **$79.95 + $.70/ft.**

For plenum applications or other lengths, see pp. 74 and 118.

Star Mux 400

Get a Twinax Star Repeater and Multiplexor All in One!

- **You choose its function—star repeater, multiplexor, or demultiplexor. Just flip a DIP switch!**
- **Easy access to RJ-45 pinout selectors for IBM®, AT&T®, USOC, and 10BASE-T configurations.**
- **Automatic polarity correction *per port* ensures compatibility with AS/400® and System/3X cabling and all twinax baluns.**
- **Multiplex up to 6600 feet (2011.7 meters)!**

Meet today's cabling needs—and support your *future* 5250 cabling requirements at a lower cost—with the multifunctional Star Mux 400.

Star Mux 400 transforms your midrange twinax daisychain topology into a cost-saving, flexible, star-wired configuration. It supports multiple applications by operating in three different modes—Mux, Demux, and Star. And changing modes is as easy as setting the DIP switch on the back panel.

In Mux Mode, Star Mux 400 supports up to eight common host/controller ports and multiplexes them onto one pair of twisted-pair, twinax, or fiberoptic cable. Demux Mode simply demuxes the host/controller ports.

In Star Mode, seven devices can be independently connected to a host/controller port via UTP cabling. Cascade two Star Mux 400s with fiberoptic cable and you can increase the distances between the host and twinax peripherals. You don't have to pay for dedicated phone lines, a controller, or other related hardware!

With Star Mux 400, you get true repeater functionality. It amplifies, regenerates, reshapes, and retimes each 5250 signal for the greatest transmission distances. Its specialized noise-reduction circuitry ensures reliable connections between host and devices. And its modular design means easy access to RJ-45 pinout selectors.

Star Mux 400 comes in two versions. Choose our single-host-port models to support up to 7 twinax devices. Or choose our dual-host-port models and support up to 14 twinax devices. And both models fit a standard 19-inch rack.

FAXBACK INFORMATION
Request Document Number: 15860
Call 412-746-5500 Anytime

SPECIFICATIONS

Cable Requirements — UTP: Category 3, 4, or 5; Fiber: Duplex fiber 50/125, 62.6/125, 85/125, 100/140 µ; Twinax: Dependent on host configuration

Maximum Distance — Star Mode: To Host: 5000 ft. (1524 m) twinax, 2500 ft. (762 m) UTP; To Device: 3000 ft. (914.4 m); Mux/Demux Mode: To Host: 5000 ft. (1524 m) twinax, 2500 ft. (762 m) UTP; Mux/Demux Link: 6600 ft. (2011.7 m) fiberoptic, 4000 ft. (1219.2 m) twinax, 2000 ft. (609.6 m) UTP

Speed — 1.04 Mbps

CE Approval — All items listed are approved

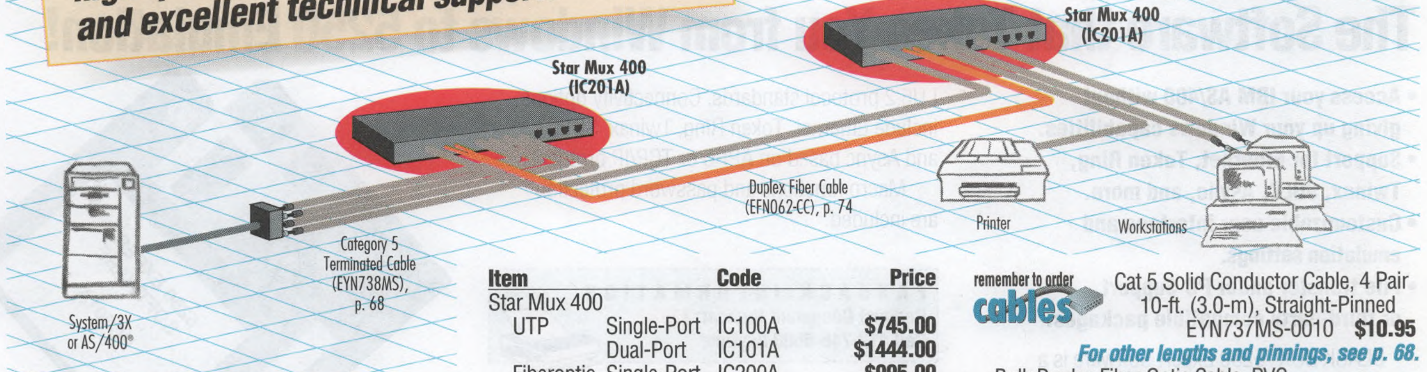
Connectors — Single-Port Models:
Host: (1) twinax female, (1) RJ-45, (1) telco male;
Device: (7) RJ-45, (1) telco male;
Mux/Demux Link: (2) fiber ST, (1) RJ-45, (1) twinax female;
Dual-Port Models: (2) twinax female, (2) 50-pin telco male, (16) RJ-45, (4) fiber ST

Power — 115/220 VAC, 60/50 Hz

Size — Single-Port: 1.7"H x 11.3"W x 8.5"D (4.3 x 28.7 x 21.6 cm);
Dual-Port: 1.7"H x 17.1"W x 9.8"D (4.3 x 43.4 x 24.9 cm)

Weight — Single-Port: 6 lb. (2.7 kg);
Dual-Port: 13 lb. (5.9 kg)

> ***"I know I can always count on Black Box for high-quality products, immediate delivery, and excellent technical support."***



Item			Code	Price
Star Mux 400				
	UTP	Single-Port	IC100A	**$745.00**
		Dual-Port	IC101A	**$1444.00**
	Fiberoptic	Single-Port	IC200A	**$995.00**
		Dual-Port	IC201A	**$1945.00**

You may also need:

Twinax Baluns **See page 341.**

remember to order cables

Cat 5 Solid Conductor Cable, 4 Pair 10-ft. (3.0-m), Straight-Pinned EYN737MS-0010 **$10.95**

For other lengths and pinnings, see p. 68.

Bulk Duplex Fiber Optic Cable, PVC ST-ST EFN062-CC **$79.95 + $.70/ft.**

For specific applications or bulk cable, see pp. 74 and 118.

Black Box Explains...

Protocol Conversion and Emulation in IBM Host Systems.

Emulation is a process that enables one device to mimic or duplicate the functions of a different, otherwise incompatible, device. It affects all functional aspects of the device being emulated from duplicating the screen format and keyboard layout to rerouting certain types of incoming signals, such as printer data. Computer emulation most commonly refers to protocol converters—connectivity devices that connect dissimilar devices, enabling them to communicate with one another. Protocol-converter emulation enables you to replace expensive synchronous devices (usually IBM® terminals and printers) with much less expensive asynchronous devices.

Today's host system typically consists of sync terminals and printers along with PCs and async printers tied to the host with emulation software or protocol converters. Emulation gives you a system solution that's both cost- and space-efficient so you can eliminate redundant hardware while making the most of your equipment investment.

Async-to-Async Emulation

This type of emulation enables a PC to take the place of an async ASCII terminal. This application is fairly straightforward, since both the async host and the PC use async interfaces and support ASCII code.

Sync-to-Async Emulation

Emulation in a sync-to-async environment is considerably more complex because multiple conversions must take place simultaneously in order for two devices to communicate. The data stream has to be converted from a sync protocol (such as SDLC or BSC) into an async format. To do this, the protocol converter must recognize and respond to the incoming protocol's addressing and operational commands. The protocol converter must change EBCDIC code to ASCII and translate the screen-formatting and keyboard-mapping control information.

The physical interface often needs another conversion—from either a synchronous coaxial or twinaxial cable system to an async RS-232 interface.

Common Emulations and Protocol Conversions

There are numerous hardware- and software-emulation packages and protocol converters available on the market today. The majority, which enable various devices to communicate with IBM host computers, fall into three general categories:

RJE (Remote Job Entry)

RJE is primarily used for file transfers between async computers and IBM bisync or SDLC systems. The earliest RJE protocol converters were used to change IBM bisync 2780 or 3780 protocols to an asynchronous format for connection to DEC™ or HP® hosts or PCs.

Another kind of RJE converter enables older IBM or other bisync systems to communicate with newer IBM SNA/SDLC hosts. These units convert the bisync 2780/3780 byte-oriented protocols into SDLC bit-oriented protocols. The SDLC version of RJE protocol is known as 3770.

3X or AS/400

Used in midrange applications for async terminals and printers to emulate true IBM printers and terminals, IBM Systems 34, 36, and 38 (collectively known as 3X systems) and the newer AS/400® systems mainly support screen-oriented applications such as database inquiry. Both systems can also support printers with various capabilities ranging from dot-matrix printers to high-end, letter-quality and laser printers. AS/400 systems can support LAN connections, too, and with the proper options can direct connections to async devices. However, emulation is typically used to support async connections to less-expensive non-IBM printers and terminals.

3270

Used for async devices to emulate IBM terminals and printers in mainframe applications, 3X and AS/400 emulations fall into two main categories: local and remote. Emulators for the local ports are commonly known as 5250 emulators. These converters usually support a wide variety of async terminals and printers.

As in the 3X or AS/400 environments, 3270 emulators are available as standalone models, internal cards for PCs or printers, or LAN gateways. You can attach controller emulators in two different ways—either directly to the system unit via a channel attachment (called a local attachment) or to a front-end processor via an RS-232 or V.35 circuit (called a remote attachment). 3270 devices are usually used for screen-oriented tasks, but file-transfer options are available to support PC connections.

◆ ◆ ◆

5250 Expert Software

The Software that Takes You from Windows to 5250 Emulation!

- **Access your IBM AS/400 without giving up your Windows capabilities.**
- **Support for Ethernet, Token Ring, Twinax, SDLC, Async, and more.**
- **Customizable user interface and emulation settings.**
- **File transfer under PC Support or third-party compatible packages.**

BLACK BOX® 5250 Expert Software is a Windows® client software application. It provides IBM 5250 workstation and printer emulation using display station pass-through over IBM APPC SNA LU6.2 protocol standards. Connectivity options include Ethernet, Token Ring, Twinax, SDLC, and Async based on APPC or TCP/IP protocol.

Macro functions and password protection are included.

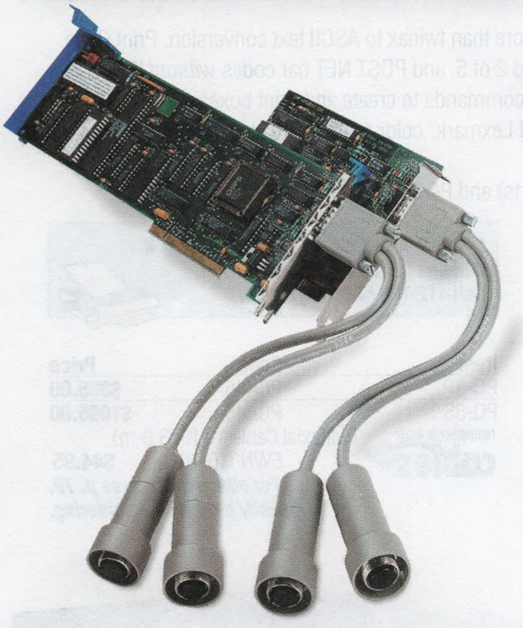
FAXBACK INFORMATION
Request Document Number: 12520
Call 412-746-5500 Anytime

Item	Code	Price
5250 Expert Software	PC301A	**$245.00**

5250 EXPERT SOFTWARE
PC301A

5250 Local Cards

Use Your PC as a 5250 Terminal!



- **Multiple sessions supported.**
- **Easy installation and configuration.**
- **PC455C-R2 supports Client Access (PC Support 400) for DOS *and* Windows!**

Connect your IBM® or compatible PC or PS/2® *directly* to an IBM System/3X or AS/400®. You can do it with the BLACK BOX® 5250 Half Card Emulator for your PC, or the 5250 EconoCard MC for your IBM PS/2 Micro Channel® PC.

With the included software, you have the power to select multiple sessions—either four or seven. And you can hot-key between active concurrent sessions on the host and your DOS PC.

You also get multiple printer emulation for virtually any printer.

SPECIFICATIONS

Display Emulation — Four-session: 5251-11, 5291, 5292/3179-1;
Seven-session: All the above, plus 3180, 3196, 3197C, 3197D

Hardware Requirements — PC455C: IBM PC, PC/XT™, AT®, or compatible with 8-bit ISA- or EISA-bus slot and 3½" drive;
PC364C: PS/2 Model 50 and above

Printer Emulation — Four-session: IBM 5224/5225, 5256, 4210 (under 4214 emulation), 4214;
Seven-session: 3812 (non IPDS™; HP LaserJet® and IBM 4029, 4039, and 4049 only), and 5219 (HP LaserJet only)

Software Requirements — DOS 3.3 or higher

Systems Supported — AS/400 and S/3X

CE Approval — PC455C-R2

Connectors — (1) 9-pin with auto-terminating twinax V

Indicators — (1) Line Sync LED on rear brackets

Size — PC455C: Half-card;
PC364C: Full-card

Item	Code	Price
5250 Half-Card Emulator	PC455C-R2	**$399.00**
5250 EconoCard MC (Micro Channel)	PC364C	**$610.00**

· ·

5250 Remote Card

A Fast Link to Your IBM Midrange—64 Kbps.

- **5251-12, 5294, or 5394 remote-controller emulation.**
- **Run seven host sessions simultaneously.**
- **Hot-key between host and DOS sessions.**

Get the fastest Card on the market—the 5250 Remote Emulator Card. It works under Windows® in a DOS partition and can emulate just about *any* printer or display station. For more flexibility, you get 132-column capability and multilanguage support (if your monitor supports 132 columns).

Autoshare between print jobs coming from the host and those coming from the PC. It supports Client Access (PC Support 400) and Rumba®. Keep up with the fast-paced midrange world—get the 5250 Remote Emulator Card.

SPECIFICATIONS

Controller Emulation — IBM 5251-12, 5294, and 5394

Display Emulation — IBM 5251-11, 5291, 5292-1, 3179-1, 3180, 3196, 3197C, and 3197D

Hardware Requirements — IBM PC, PC/XT, AT, or compatible with 8-bit ISA- or EISA-bus slot and 3½" floppy drive

Printer Emulation — IBM 5224/5225, 5256, 4210 (under 4214 emulation), 4214, 3812 (non IPDS, HP LaserJet and IBM 4029, 4039, and 4049 only), and 5219 (HP LaserJet only)

Sessions Supported — Up to 7

Software Requirements — DOS 3.3 or higher

Speed — Up to 64 Kbps

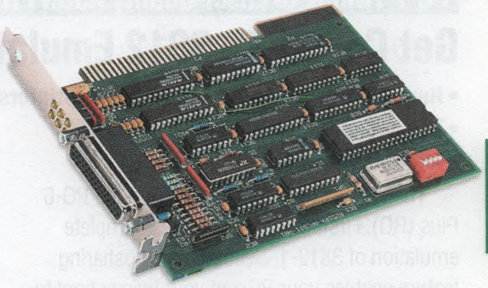
CE Approval — All listed items are approved

Interface — RS-232, X.21, or V.35, depending on the Adapter Cable used

Connectors — (1) DB44 (proprietary) female

Size — Half-card: 4.2"H x 6"D (10.7 x 15.2 cm)

Weight — 0.3 lb. (0.1 kg)



Item	Code	Price
5250 Remote Emulator Card	PC456C	**$475.00**

remember to order
cables

Adapter Cables, 20-ft. (6.1-m)

X.21	EHN060-0020	**$50.00**
RS-232	EHN061-0020	**$50.00**
V.35	EHN062-0020	**$50.00**
X.21 M.E.	EHN063-0020	**$50.00**
V.24/232 M.E.	EHN064-0020	**$50.00**
V.35 M.E.	EHN065-0020	**$50.00**

· ·

Reverse Protocol Converter 4000

ASCII to 3270 or 5250 in a Snap!

- Converts ASCII into 3270 or 5250 format.
- Autosensing coax or twinax connection.
- Easy configuration and setup.
- Connects virtually any ASCII (PC, LAN, RS-6000) host via parallel or RS-232 serial.
- Powerful diagnostic mode.

FAXBACK INFORMATION
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Call 412-746-5500 Anytime

Select
Alt
BLACK BOX (412) 746-5500
Reverse Protocol Converter 4000
Menu
Exit
I/O

SPECIFICATIONS

Emulation — IBM Proprinter® or Epson® FX

CE Approval — 230-VAC version: PC480AE

Interface — Input: Parallel or RS-232 serial;
Output: Twinax or coax

Connectors — (1) DB25 female for serial input;
(1) 36-pin Centronics® for parallel input;
(1) DB9 male for twinax or coax output;
(1) DB25 female for parallel diagnostic

Power — 115-VAC, 60-Hz wallmount transformer (9-VAC) (230-VAC, 50-Hz version on request)

Size — 1.8"H x 6.4"W x 5.5"D (4.6 x 16.3 x 13.9 cm)

Weight — 3 lb. (1.4 kg)

Item	Code	Price
Reverse Protocol Converter 4000	PC480A	**$1295.00**

BLACK BOX®
(412) 746-5500
PQ-8S
SW1
SW2
Host Line Sync
Printer On Line
Data From Host
Serial Data Out
Power
On
Off

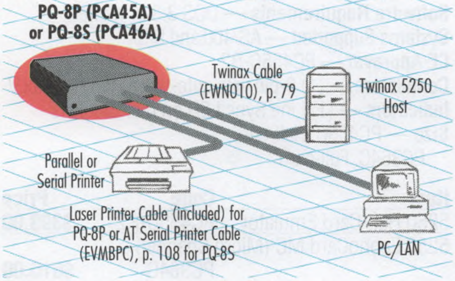
PQ-8P and PQ-8S IBM Twinax to ASCII Converters

Graphics, Bar Codes, and Text—from Your ASCII Printer!

- **Use your printer for bar codes, graphics, and text from your S/3X or AS/400 Host.**
- **Backward-compatible with the PQ-7—and at a lower cost!**

Use your ASCII laser or dot-matrix printer for more than twinax to ASCII text conversion. Print Code 3 of 9, Code 128, UPC A, EAN 8, EAN 13, Interleaved 2 of 5, and POST NET bar codes *without* IPDS™. With the graphics capabilities, you can use HP-GL® commands to create and print boxes, circles, lines, and even bar and pic charts. The new HP® and Lexmark™ color printers are also supported with commands for color printing.

As you would expect, the PQ-8P (for parallel ports) and PQ-8S (for serial ports) feature true IBM® SCS printer emulations and standard parallel or serial printer-sharing. Printer cable is included.


PQ-8P (PCA45A)
or PQ-8S (PCA46A)
Twinax Cable
(EWN010), p. 79
Twinax 5250
Host
Parallel or
Serial Printer
Laser Printer Cable (included) for
PQ-8P or AT Serial Printer Cable
(EVMBPC), p. 108 for PQ-8S
PC/LAN

SPECIFICATIONS

Emulation — IBM 3812-1, 4214, 5224, 5225, 5256 (all non IPDS)

CE Approval — 230-VAC versions: PCA45AE–PCA46AE

Indicators — (5) LEDs: PQ-8P: Host Ready, Printer Ready, Data from Host, Data from PC/LAN, Power; PQ-8S: Host Ready, Printer Ready, PC/LAN Ready, Data Out, Power

Power — 9-V wallmount transformer

Size — 2.1"H x 5.5"W x 6.5"D (5.4 x 14 x 16.5 cm)

FAXBACK INFORMATION
Request Document Number: 15774
Call 412-746-5500 Anytime

Item	Code	Price
PQ-8P	PCA45A	**$895.00**
PQ-8S	PCA46A	**$1095.00**
remember to order cables	Twinaxial Cable 10-ft. (3.0-m) EWN010-0010	**$44.95**

For other lengths, see p. 79.
Specify gender when ordering.

PQ7 PROTOCOL CONVERTER
SW1
SW2
SW3
Cancel
Test
Line Sync
PC Share
Ready
Power
BLACK BOX
On
Off

PQ-7 Twinax to Laser-Quality ASCII Printer

Get Complete 3812 Emulation and Autosharing!

- **Runs high-quality graphics and laser printers.**
- **Use with parallel-supported printers—parallel autosharing!**

The PQ-7 is the next step up from the PQ-6 Plus (RO). First, the PQ-7 provides complete emulation of 3812-1. Second, its autosharing feature enables your PC and your twinax host to share your ASCII laser printer. Just attach the host via the twinax port and the PC through the mini Centronics® parallel port. Print jobs are handled first-come, first-served. Printer cable is included.

Printers Supported:

- IBM or compatible laser
- HP® PCL® 4
- IBM PPDS
- Epson

SPECIFICATIONS

Emulation — IBM 4214, 5225, 5224, 5256, and 3812-1 (non IPDS)

Connectors — (1) DB9 twinax V-cable, (1) mini Centronics parallel, (1) 25-pin IBM PC parallel output to printer, (1) barrel for power, female

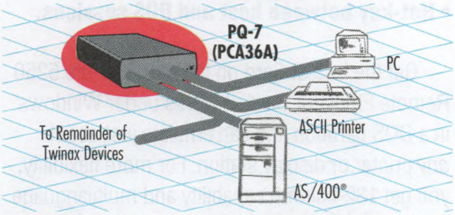
Indicators — (4) LEDs: Power, Ready, Line Sync, PC Share

Power — 115 VAC, 60 Hz, 15 watts (230-VAC, 50-Hz version on request)

Size — 1.5"H x 6.3"W x 9.8"D (3.8 x 16 x 25 cm)

Weight — 2.5 lb. (1.1 kg)

FAXBACK INFORMATION
Request Document Number: 11880
Call 412-746-5500 Anytime


PQ-7
(PCA36A)
PC
ASCII Printer
To Remainder of
Twinax Devices
AS/400®

Item	Code	Price
PQ-7	PCA36A	**$1295.00**
remember to order cables	Twinaxial Cable 10-ft. (3.0-m) EWN010-0010	**$44.95**

For other lengths, see p. 79.
Specify gender when ordering.

PQ-6 Plus (RO) Twinax to ASCII Printer

Cut Printer Costs! Run Serial/Parallel Printers on Your AS/400 or S/3X Host!

- **IBM 5256, 5225, and 5224 emulation.**
- **Ideal for async card embossers and bar-code printers.**

Choose the printer you want to use! With the BLACK BOX® PQ-6 Plus (RO) you can run virtually any async RS-232 or Centronics compatible printer—serial or parallel—with your AS/400® or S/3X host.

If your printer isn't one of those listed, call Technical Support at **412-746-5500**. We can customize the PQ-6 Plus for your application.

BLACK BOX
PQ-6 PLUS

SPECIFICATIONS

Controls — Reset, Start, Stop, LF, FF, Test

Speed — Serial port, 50 bps to 19.2 Kbps

Interface — IBM twinaxial; RS-232/V.24 DCE asynchronous or Centronics type parallel

Connectors — (1) DB15P male with twinax V, (1) DB25S female

Indicators — (5) LEDs: DTR, Line Sync, Power, Test, Data Out

Power — 115-VAC, 60-Hz wallmount transformer, 90 watts (230-VAC version on request)

Size — 2.1"H x 8.8"W x 11.5"D (5.3 x 22.4 x 29.2 cm)

Weight — 4 lb. (1.8 kg)

Printers Supported:

- Epson® MX-80
- TI 810/820
- NEC Spinwriter®
- IBM® Proprinter®
- OKIDATA® 2410
- OKIDATA 83/84
- Generic 3500
- IBM Proprinter

Item	Code	Price
PQ-6 Plus (RO)	PCA35A-R2	**$1195.00**
remember to order cables	Twinaxial Cable, 10-ft. (3.0-m) EWN010-0010	**$44.95**

For other lengths, see p. 79.
Specify gender when ordering.

For parallel applications:

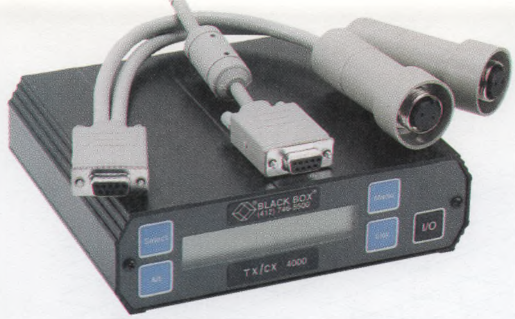
Item	Code	Price
Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**

For other lengths and genders, see p. 106.

For serial applications:

Item	Code	Price
Specialty Cross-Pinned Cable II	EYN254C	**$20.95 + $.43/ft.**

Specify gender and length when ordering.



TX/CX 4000 Twinax/Coax Printer Interface

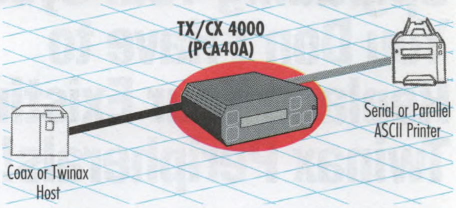
Run an ASCII Printer with Your IBM Twinax or Coax Host.

- **Use your parallel or serial ASCII printer with an IBM 3270 or AS/400 host.**
- **Share your printer between your parallel and serial PC/LANs and a twinax or coax host.**

Now you can connect your favorite ASCII printer—HP®, Lexmark™, Epson®, and others—to your IBM® AS/400®, S/3X, or 3270 host. Get a twinax *or* a coax printer interface in one with the new TX/CX 4000!

Setup is easy via either the front panel or downloadable host commands. And the TX/CX 4000 automatically senses a twinax or coax connection.

With Autosharing, you can use your printer with your PC and twinax or coax host. The front-panel LCD displays the realtime status of print jobs.



FAXBACK INFORMATION
Request Document Number: 14175
Call 412-746-5500 Anytime

SPECIFICATIONS

Emulation — Printer: IBM 3270, 5250, 3287/68, 62, 4214, 4224 (non IPDS™), 5224, 5225, 5256
CE Approval — 230-VAC version: PCA40AE
Interface — Twinax/coax, Centronics parallel, serial
Connectors — Serial out: (1) RS-232 serial, male; Parallel out: (1) DB25 female; IBM Host: (1) DB9 male, (DB9 to coax/twinax "T" included); Serial in: (1) DB25 female; Parallel in: (1) 36-pin Centronics female
Power — 115-VAC, 60-Hz wallmount transformer (9 VAC) (230-VAC, 50-Hz version on request)
Size — 1.8"H x 6.4"W x 5.5"D (4.6 x 16.3 x 13.9 cm)
Weight — 3 lb. (1.4 kg)

Item	Code	Price
TX/CX 4000	PCA40A	**$1295.00**
remember to order cables Twinaxial Cable, 10-ft. (3.0-m)	EWN010-0010	**$44.95**
For other lengths, see p. 79. Specify gender when ordering.		
Coaxial Cable 10-ft. (3.0-m)	ETN59-0010-BNC	**$9.95**
For other lengths, see p. 79.		

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3262 Printer Adapter

Connect Your 3262 to Your AS/400 or Advanced System 36.

- **Twinax ports for AS400/3X.**
- **Parallel port for PC connection.**
- **Shares automatically between PC parallel and twinax hosts.**

Follow menu options in the 2- to 16-line LCD window to easily configure your 3262 Printer Adapter.

Connect your IBM Model B1 3262 printer to an AS/400, S/3X, or remote communications controller via twinax cable. In just 10 minutes, your printer becomes a standard twinax printer, supporting AS/400 autoconfiguration.

The 3262 Printer Adapter has a parallel input port which enables a 3262 Printer to be used as a standard PC printer. And with automatic input selection, the Adapter can be connected to the twinax and parallel systems simultaneously.

SPECIFICATIONS

Data Rate — Twinax input: 1 Mbps; Parallel input: Up to 43 Kcps
Emulation — 5256, 5262, 4245, IBM Proprinter®, Epson® FX
Flow Control — Controlled by printer
System Hardware Required — IBM 3262 B01 printer
Interface — IBM twinaxial, IBM Channel Bus, and Centronics parallel
Connectors — (2) Twinax female, (1) 36-pin Centronics female, (1) IEC 320 male power inlet; (2) Internal full-size serpentine female
Power — 110-/220-VAC switchable power supply
Size — 12"H x 4"W x 9"D (30.5 x 10.2 x 22.9 cm)
Weight — 12 lb. (5.4 kg)

FAXBACK INFORMATION
Request Document Number: 13174
Call 412-746-5500 Anytime

Item	Code	Price
3262 Printer Adapter	PC3262A	**$1795.00**
remember to order cables Twinaxial Cable, 10-ft. (3.0-m)	EWN010-0010	**$44.95**
For other lengths, see p. 79. Specify gender when ordering.		

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Twinax Multiport Protocol Converter

Attach up to Seven Devices to Your IBM Twinax Port.

- **Dual-CPU architecture.**
- **Dual-purpose port—serial or parallel.**
- **Async speeds of 57.6 Kbps.**
- **Automatic DCE/DTE detection.**
- **Screen optimization.**

This high-performance Converter connects multiple devices to an IBM twinax port. Its dual-CPU design eliminates performance problems when all async ports are in use. File transfers, screen paints, and multitasking are faster, too. The dual-purpose port provides serial or parallel printer connection.

With data speeds of up to 57.6 Kbps on the async ports, throughput speeds and screen paints are as fast as they would be from a remote twinax terminal.

The base unit comes with three serial ports and one selectable parallel or serial port. An Expansion Card may be used to support a total of seven async devices. An Adapter handler diskette for Client Access (PC Support 400) is included. 5250 DOS and Windows® Emulation software (PC058A-R2 or PC059A) is available.

SPECIFICATIONS

Protocol — Asynchronous, Twinax 5250
Speed — 57.6 Kbps
CE Approval — PC250A, PC250C
Interface — Twinax, serial, parallel
Connectors — PC250A: (2) twinax; Both models: (4) DB9 male, (1) DB25 female
Indicators — PWR, SYS OK, Line Sync, DCD, DTR, DSR, TXD, RXD
Power — 115/230 VAC, 60/50 Hz, selectable
Size — 3.5"H x 17.3"W x 11.8"D (8.9 x 43.9 x 30 cm)
Weight — 8 lb. (3.6 kg)

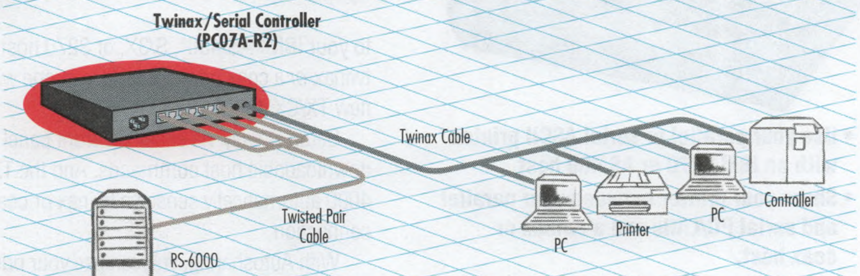
FAXBACK INFORMATION
Request Document Number: 12568
Call 412-746-5500 Anytime

TWINAX MULTIPORT
BLACK BOX

Item	Code	Price
Twinax Multiport Protocol Converter	PC250A	**$2645.00**
Expansion Card	PC251C	**$600.00**
5250 Emulation Software		
DOS	PC058A-R2	**$150.00**
Windows	PC059A	**$245.00**
remember to order cables Twinaxial Cable, 10-ft. (3.0-m)	EWN010-0010	**$44.95**
For other lengths, see p. 79. Specify gender when ordering.		
For Serial applications:		
AT® Premium Modem Cable, 10-ft. (3.0-m)	EVMBMC-0010	**$19.95**
For other lengths, see p. 109.		

Twinax/Serial Controller

Upgrading Your System? You Don't Have to Replace Your Existing Twinax Peripherals!


Twinax/Serial Controller
(PC07A-R2)
Twinax Cable
Twisted Pair Cable
RS-6000
PC
Printer
PC
Controller

- **Works with any ASCII system using twinax terminals and/or printers.**
- **Choose the 7- or 14-Port model.**
- **Combine it with other controllers in your system.**

Now there's no need to replace all your twinax peripherals when you upgrade your system! Our Twinax/Serial Controller can connect all your existing twinax peripherals so they operate as standard ASCII devices. It's the perfect solution for customers who want to migrate from their twinax system to a new system supporting ASCII devices.

Available in a 7- or 14-Port model, the Controller works with PC network, RS/6000, DEC™, HP®—practically any system with RS-232 serial ports! The Twinax/Serial Controller emulates VT100™ or VT220™ for terminals, and Epson® FX or IBM® Proprinter® for printers.

The Twinax/Serial Controller can also be combined with other controllers in the same system. And installation takes no more than 10 minutes and requires no modification to your twinax network.

TWINAX↔SERIAL CONTROLLER
POWER
TWINAX
READY
BLACK BOX
(412) 746-5500

SPECIFICATIONS

Display/Switch — (7) or (14) serial status LEDs; (1) 7-segment diagnostic display; (1) diagnostic operator switch
Printer Emulation — Epson FX, IBM Proprinter
Terminal Emulation — VT100, VT220
CE Approval — PC07A-R2
Connectors — (2) autoterminated twinax; (7) or (14) RJ-45 for serial ports
Power — 110–220-VAC power supply, autosensing
Size — 13.5"H x 6.5"W x 2"D (34.3 x 16.5 x 5.1 cm)
Weight — 7 lb. (3.2 kg)

FAXBACK INFORMATION
Request Document Number: 13167
Call 412-746-5500 Anytime

Item	Code	Price
Twinax/Serial Controller		
7-Port	PC07A-R2	**$1695.00**
14-Port	PC14A-R2	**$2195.00**
Twinaxial Cable, 10-ft. (3.0-m)		
PVC	EWN010-0010	**$44.95**

remember to order cables

For plenum applications or other lengths, see p. 79. Specify gender when ordering.

◆ ◆ ◆

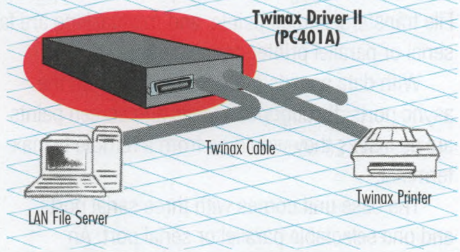
Twinax Driver II

Run *Any* Non IPDS Twinax Printer from Your LAN or ASCII System.

TWINAX DRIVER II
BLACK BOX®
Reset
Line Parity Major Pwr
Sync Error Error
SW1
SW2
SW3
On
Off

- **Makes your twinax printer compatible with your LAN, RISC System/6000®, and other async hosts.**
- **Parallel input, twinax port output.**

The Twinax Driver II converts ASCII Epson FX or IBM Proprinter formatting commands to IBM twinax printer commands. With the Command Pass-Thru feature, you can insert EBCDIC commands into your file and send them straight to your printer. Setup is quick and easy. The Printer cable is included.


Twinax Driver II
(PC401A)
Twinax Cable
LAN File Server
Twinax Printer

SPECIFICATIONS

Connectors — (1) 36-pin mini Centronics®, (1) DB9 for twinax output, (1) IBM PC standard DB25 female
Power — 115 VAC, 60 Hz, 15 watts
Size — 1.5"H x 6.3"W x 9.8"D (3.8 x 16 x 25 cm)
Weight — 2.5 lb. (1.1 kg)

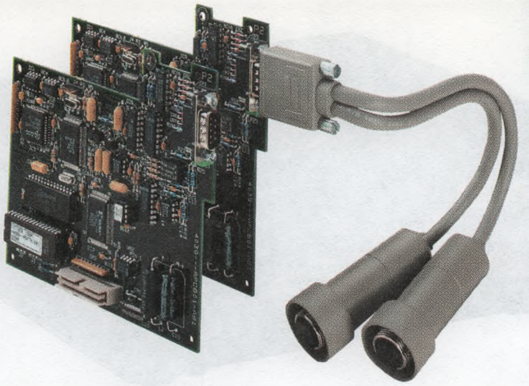
Item	Code	Price
Twinax Driver II	PC401A	**$1095.00**
Twinaxial Cable, 10-ft. (3.0-m)		
PVC	EWN010-0010	**$44.95**

remember to order cables

For plenum applications or other lengths, see p. 79. Specify gender when ordering.

Printers Supported:

- 5256 Model 1-3
- 5262 (emulates 5256)
- 5224 Model 1-3
- 5225 Model 1-4
- 4210
- 4214 Model 2 (non IPDS™)
- 5219 D01, D02
- 4234 Model 2
- 3812 Model 1



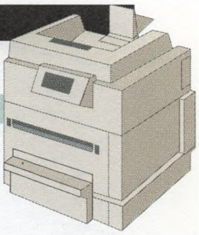
Printer Emulation Cards

The Problem: The Cost of Expensive IBM System Printers.

The Solution: Use Your Inexpensive Async Printers to Do the Job.

CE Approval — PC119C–PC120C, PC130C–PC131C, PCA60C-R2, PCD09C, PCD41C, PC118C-R2, PC121C-R2

Twinax	Coax
Compatibility — IBM® AS/400® or S/3X host, or 5X94 controller	**Compatibility** — IBM 30XX, 43XX, and 937X host or 3174, 3274, and 3276 controllers



Lexmark™ 4039, OPTRA® SERIES

The Lexmark Card Connects to either Twinax *or* Coax!

Twinax

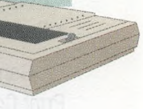
Emulation — IBM 3812-1 (non IPDS™)
Connectors — (1) DB9 male with twinax V-cable (included)

Item	Code	Price
4039 Laser Card with Twinax Cable Adapter (included)	PC130C	$949.00

Coax

Emulation — IBM 3287, 3262, 3268, 3812-1, 4028, 4214, or 4224 (non IPDS)
Connectors — (1) DB9 male for coax cable (included)

Item	Code	Price
4039 Laser Card with Coax Cable Adapter (included)	PC131C	$949.00



Epson® TYPE B DOT-MATRIX OR LASER PRINTERS

Twinax

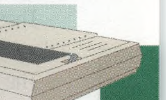
Emulation — IBM 5912, 3812 (non IPDS), 4124, 5224 dot-matrix printer
Connectors — (1) DB9 with twinax V-cable (included), (1) mini Centronics® (cable to DB25 included), (1) 36-pin internal Type B

Item	Code	Price
Epson® Twinax Laser Card	PC120C	$795.00

Coax

Emulation — IBM 3287, 3262, 3268, 3812-1, 4028, 4214-1, or 4224 (non IPDS) printer
Connectors — (1) BNC female, (1) mini Centronics parallel female (cable to DB25 included)

Item	Code	Price
Epson Coax Laser Card	PC119C	$895.00



Epson TYPE A PRINTERS

Twinax

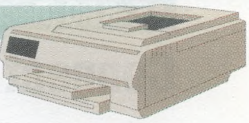
Emulation — IBM 4214 printer for S/36/38 and AS/400®; 5224/25 for S/34
Connectors — DB9 male for twinaxial V-cable (included)

Item	Code	Price
Emulation Card, Epson Printer	PCA60C-R2	$795.00

Coax

Emulation — IBM 3287 printer
Connectors — (1) BNC female, (1) mini Centronics

Item	Code	Price
EP Coax Adapter Board II	PCD09C	$795.00



HP® LaserJet® II, IID, III, OR IIID PRINTER

Twinax

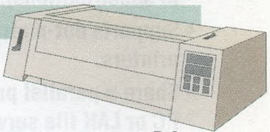
Emulation — IBM 5219 or 3812-1 (non IPDS) printer; does not support IPDS or external multibin sheet feeder
Connectors — DB9 to twinaxial V-cable (included)

Item	Code	Price
PQ-Laser II Card	PCC34-C	$1020.00

Coax

Emulation — IBM 3287 printer
Connectors — (1) BNC female, (1) DB9 male RS-232

Item	Code	Price
A/C Laser II Card-2	PCD41C	$895.00



IBM 2380/81 OR 2390/91 and the New 2380+/81+, 2390+/91+

Twinax

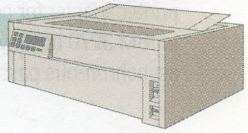
Emulation — IBM 4214, 5224, 5225, 5256 printer
Connectors — 36-pin Centronics female; DB9 male for twinax V-cable (included)

Item	Code	Price
2380/2390 Twinax Emulation	PC111C	$895.00
2380+/2390+ Twinax Emulation	PC111C+	$895.00

Coax

Emulation — IBM 3287, 3262, 3268, 4214, or 4224 (non IPDS) printer
Connectors — IBM Type A (BNC) female, Centronics female

Item	Code	Price
2380/2390 Coax Emulation	PC110C	$895.00
2380+/2390+ Coax Emulation	PC110C+	$895.00



IBM 4226 PRINTER and the New 4227

Twinax

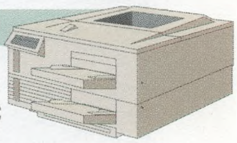
Emulation — IBM 4214, 5224, 5225, 5226 printer
Connectors — DB9 to twinaxial V-cable (included)

Item	Code	Price
4226 Twinax Emulation	PC112C	$895.00
4227 Twinax Emulation	PC122C	$895.00

Coax

Emulation — IBM 3287, 3262, 3268, 4214, or 4224 (non IPDS) printer
Connectors — IBM Type A coax (BNC), Centronics female

Item	Code	Price
4226 Coax Emulation	PC113C	$895.00
4227 Coax Emulation	PC123C	$895.00



HP LaserJet IIISI OR LaserJet 4 PRINTER

Twinax

Emulation — IBM 3812-1 (non IPDS) printer
Connectors — (1) DB9 with twinax V-cable (included), (1) 36-pin Centronics, (1) 48-pin MIO connector

Item	Code	Price
HP IIISi Twinax Card	PC118C-R2	$845.00

remember to order cables

Coaxial Cable, 10-ft. (3.0-m) *(IBM Part #2577672)* PVC	ETN62-0010-BNC	$9.95

Coax

Emulation — IBM 3287, 3262, 3268, 4214, 3812-1, 4028, or 4224 (non IPDS) printer
Connectors — (1) BNC to host or controller, (1) Centronics parallel to PC

Item	Code	Price
Laser Card 4	PC121C-R2	$870.00

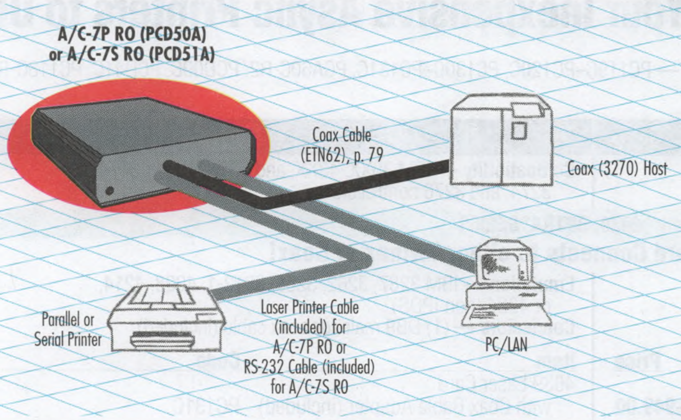
remember to order cables

Coaxial Cable, 10-ft. (3.0-m) *(IBM Part #2577672)* PVC	ETN62-0010-BNC	$9.95

A/C-7P RO and A/C-7S RO 3270 to ASCII Converters

Graphics, Bar Codes, and Text—from Your IBM 3270 Coax Host, Too!

BLACK BOX
(412) 746-5500
SW1
1 2 3 4 5 6 7 8
Host Line Sync
Printer On Line
Data From Host
Data From Parallel
A/C-7P RO
Power
On
Off


A/C-7P RO (PCD50A)
or A/C-7S RO (PCD51A)
Coax Cable
(ETN62), p. 79
Coax (3270) Host
Parallel or
Serial Printer
Laser Printer Cable
(included) for
A/C-7P RO or
RS-232 Cable (included)
for A/C-7S RO
PC/LAN

- **Plug-and-play compatible with the A/C-5 RO—and at a lower price!**
- **Connect specialty label printers to your IBM mainframe.**

Generate multiple graphics symbols—as well as seven different bar codes—without IPDS™! Print Code 3 of 9, Code 128, UPC A, EAN 8, EAN 13, Interleaved 2 of 5, and POST NET bar codes.

With the new graphics capabilities, you can use HP® and Lexmark™ color printers to add color charts and graphs to reports that were limited to only text.

These new features can save you time and money, too. Integrate graphics and bar codes within a document and eliminate those costly preprinted forms.

The A/C-7P RO (for parallel ports) and A/C-7S RO (for serial ports) feature true IBM® SCS printer emulations and standard parallel or serial printer-sharing. Printer cable is included.

SPECIFICATIONS

Emulation — 3262, 3268, 3287, 3812-1, 4214, 4224 (all non IPDS)

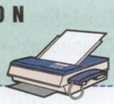
Indicators — (5) LEDs; PCD50A: Host Ready, Printer Ready, Data from Host, Data from PC/LAN, Power;
PCD51A: Host Ready, Printer Ready, PC/LAN, Ready, Data Out, Power

CE Approval — 230-VAC versions: PCD50AE–PCD51AE

Power — 115-VAC, 60 Hz, 9-V wallmount transformer (230-VAC, 50-Hz version on request)

Size — 2.1"H x 5.5"W x 6.5"D (5.4 x 14 x 16.5 cm)

FAXBACK INFORMATION
Request Document Number: 15781
Call 412-746-5500 Anytime



Item	Code	Price
A/C-7P RO	PCD50A	**$995.00**
A/C-7S RO	PCD51A	**$1095.00**
remember to order cables: Coaxial Cable, 10-ft. (3.0-m) *(IBM® Part #2577672)*		
PVC	ETN62-0010-BNC	**$9.95**

For plenum applications or other lengths, see p. 79.

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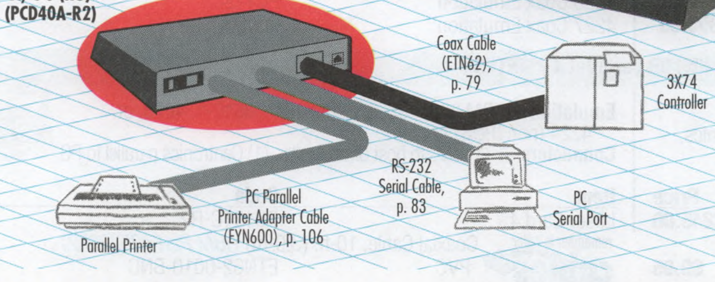
A/C-6 RO (Receive Only) 3270 to HP® LaserJet®

Connect Your ASCII Printers to IBM 3270 Hosts.

- **Emulates an IBM 3287 printer (as listed in specifications).**
- **Supports dot-matrix and HP® LaserJet® printers.**
- **Share a parallel printer between your serial PC or LAN file server and your 3270 host.**

The BLACK BOX® A/C-6 (RO) is a standalone printer adapter for connecting ASCII printers to IBM 3270 host systems. The asynchron-ous passthrough feature enables you to share a printer between a serial PC or LAN server and a 3270 host. It can drive a laser printer from SAS-GRAPH®, C/A TELLAGRAF, or from GDDM® using Maersk or ACX® software. And it supports both standard coax cable or less expensive twisted-pair wire.

BLACK BOX
(412) 746-5500
A/C-6 (RO)


A/C-6 (RO)
(PCD40A-R2)
Coax Cable
(ETN62),
p. 79
3X74
Controller
RS-232
Serial Cable,
p. 83
PC
Serial Port
PC Parallel
Printer Adapter Cable
(EYN600), p. 106
Parallel Printer

SPECIFICATIONS

Emulation — IBM 3287

Protocol — IBM 3270

Speed — Coax: 2.4 MHz; Serial: 9600 bps

System Requirements — IBM 3X74 or compatible controller

CE Approval — Yes

Interface — Centronics® parallel, RS-232 DTE/DCE, and Type A coax

Connectors — (1) DB25 male (serial), (1) DB25 female (parallel), (1) RJ-45 female, (1) BNC female

Power — 115/230 VAC selectable, 60/50 Hz, 7 watts

Size — 2.7"H x 12"W x 8.5"D (6.9 x 30.5 x 21.6 cm)

Weight — 4.3 lb. (2 kg)

Item	Code	Price
A/C-6 RO (Receive Only)	PCD40A-R2	**$1095.00**
remember to order cables: Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**
For other lengths and genders, see p. 106.		
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83. Specify gender when ordering.		
Coaxial Cable, 10-ft. (3.0-m) *(IBM® Part #2577672)*		
PVC	ETN62-0010-BNC	**$9.95**

For plenum applications or other lengths, see p. 79.

A/C-5 RO (Receive Only) 3270 to IBM® Laser Printer

Dot-Matrix and IBM *Laser* Printers Work with Your 3270 Controller.

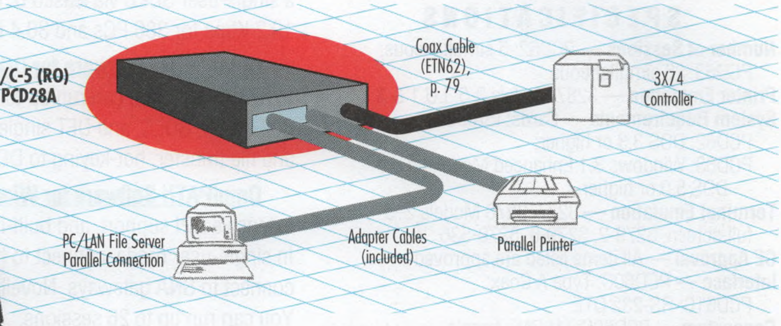
- **Emulates dot-matrix and IBM system laser printers (non IPDS).**
- **Share a printer between your 3270 coax and your parallel PC port or alternate host.**
- **Supports LU3 (DSC) and LU1 (SCS) mode printing.**

Your 3270 can share a printer with a PC or alternate host. And your ASCII printer can emulate IBM system laser printers (non IPDS™)—and dot-matrix printers, too. Change configuration settings and store user-definable setup selections with Host-Downloadable Commands (HDC).

SPECIFICATIONS

Configuration — Front-panel; HDC via coax or parallel port
Emulation — IBM 3287, 3286, 4214-1, 4224 (non IDPS) dot-matrix printers; IBM 3812 and 4028 (non IDPS) laser printers
Protocol — 3270
Speed — Coax: 2.35 MHz
System Requirements — IBM® 3X74 or compatible controller
Interface — Centronics® parallel, Type A coax
Connectors — (1) BNC female, (1) Centronics parallel for alternate host (PC) sharing, (1) DB25 female for parallel printer port
Power — 115 VAC, 60 Hz, 15 watts (230-VAC, 50-Hz version on request)
Size — 1.5"H x 6.3"W x 9.8"D (3.8 x 16 x 24.9 cm)
Weight — 2.5 lb. (1.1 kg)

BLACK BOX
A/C 5 RO
CU
ACTIVE
SHARE PORT
ACTIVE
PA1/PA2
ACTIVE
PA1
CANCEL
PA2
ON
OFF
PWR


A/C-5 (RO)
PCD28A
Coax Cable
(ETN62),
p. 79
3X74
Controller
PC/LAN File Server
Parallel Connection
Adapter Cables
(included)
Parallel Printer

NOTE: Adapter cables are included.

Item	Code	Price
A/C-5 RO (Receive Only)	PCD28A	$1195.00

remember to order cables

Coaxial Cable, 10-ft. (3.0-m) *(IBM® Part #2577672)*

PVC	ETN62-0010-BNC	$9.95

For plenum applications or other lengths, see p. 79.

• • • • • • • • • • • • • • • • • • • •

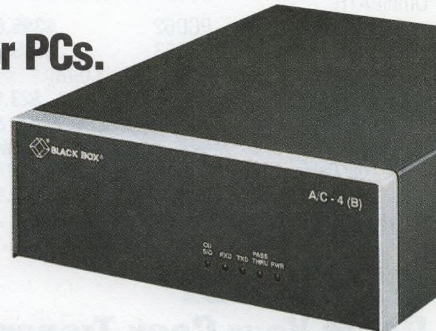
A/C-4 (B) (Deluxe)-Bidirectional 3270 to ASCII Terminal or PC

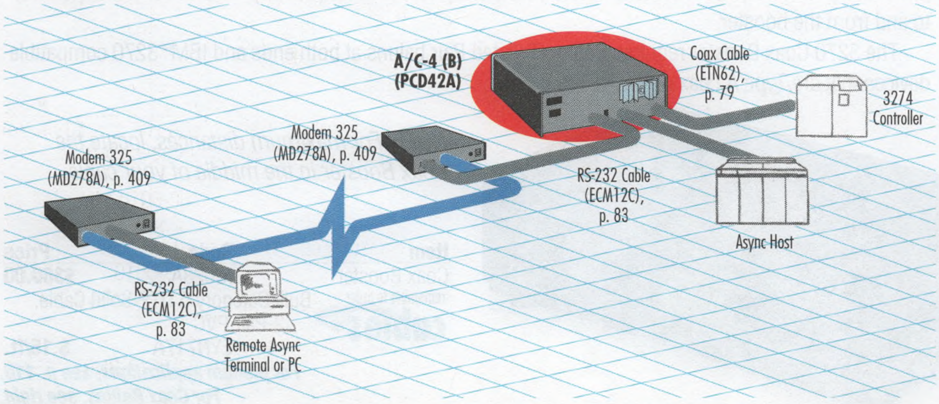
Access Your IBM Mainframes through ASCII Terminals or PCs.

- **Transfers files bidirectionally.**
- **Supports over 50 terminal types.**
- **Hot-keys between sync and async hosts.**
- **Enables generic async terminal emulation.**

The BLACK BOX® A/C-4 (B) includes full 3278 CUT emulation—no extra software needed! Transfer files *bidirectionally*. Alternate between sync and async sessions. Hot-key between your IBM host and your async host. The Converter supports over 50 terminal types, including ADM-3A.21, ANSI 3.64, IBM 3101, TV 910/925, VT52™, VT100™, and ADDS® Viewpoint® terminals; or a PC or PS/2® running these emulations.

The A/C-4 (B) (Deluxe) has a Compu-Driver mode, which enables generic async terminal emulation. This eliminates screen- and cursor-positioning commands.


BLACK BOX
A/C-4 (B)


A/C-4 (B)
(PCD42A)
Coax Cable
(ETN62),
p. 79
3274
Controller
Modem 325
(MD278A), p. 409
Modem 325
(MD278A), p. 409
RS-232 Cable
(ECM12C),
p. 83
Async Host
RS-232 Cable
(ECM12C),
p. 83
Remote Async
Terminal or PC

SPECIFICATIONS

Emulation — IBM 3278 CUT mode only
Protocol — 3270 and async ASCII
Speed — Coax: 2.4 MHz; Terminal/auxiliary ports: Up to 19.2 Kbps
System Requirements — IBM 3X74 controller or compatible
CE Approval — 230-VAC version: PCD42AE
Connectors — (2) DB25 female, (1) BNC female
Power — 115/230 VAC, 60/50 Hz, 20 watts
Size — 3.8"H x 11"W x 14"D (9.7 x 27.9 x 35.6 cm)
Weight — 16 lb. (7.3 kg)

Item	Code	Price
A/C-4(B) (Deluxe)	PCD42A	$1395.00

remember to order cables

RS-232 Cable, 10-ft. (3.0-m)

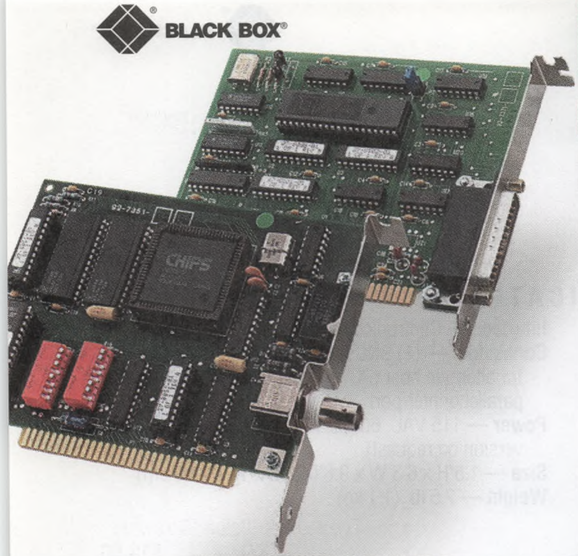
	ECM12C-0010	$17.95

For other lengths, see p. 83.
Specify gender when ordering.

Coaxial Cable, 10-ft. (3.0-m) *(IBM® Part #2577672)*

PVC	ETN62-0010-BNC	$9.95

For plenum applications or other lengths, see p. 79.



3270 Emulation Board

3270 Users—Run up to 26 Windows® or 5 DOS Sessions from Your PC!

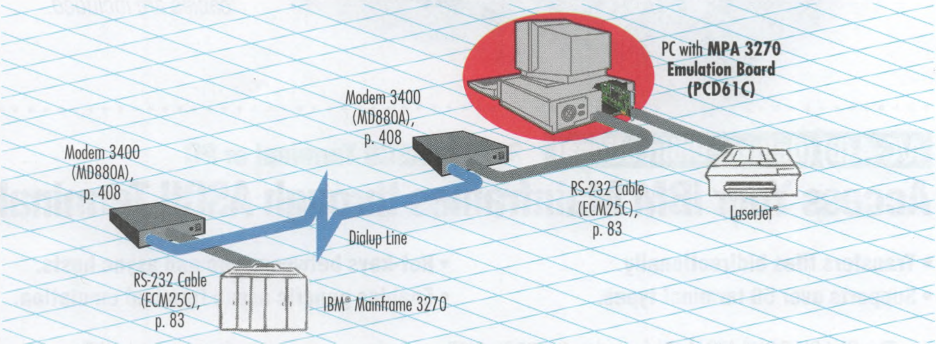
- **Your PC will talk to your 3270 mainframe with the BLACK BOX® 3270 Emulation Board and OmniPATH™ software.**
- **Local or remote access.**
- **Microsoft® Windows® compatible.**

Coax (Local) Board—The Coax (Local) Board supports DFT IBM® 3x74 Controller coax connections. It's IBM® and IRMA™ register-compliant.

MPA (Remote) Board—The MPA (Remote) Board emulates an IBM 3174 Controller and supports a single-user SDLC via leased or dialup line with the sync modem of your choice. It operates at up to 19.2 Kbps for 386 PCs and 38.4 Kbps for 486 PCs. Both Boards are ISA-bus half-cards.

OmniPATH™ Software for DOS—The DOS software supports full-screen 3278/79 terminals and 3287 printers. You can run up to five terminal, printer, or combined sessions. You also get support for 802.2 LLC, SDLC, and DFT single-user and LAN implementations. Features include background printing and file transfer, hot-keying to DOS, and API support.

OmniPATH Software for Windows—OmniPATH Windows software has full Windows functionality, extensive API support, and built-in security. Macro record and playback automates 3270 functions. In single-user mode, connect to host or controller with DFT, SDLC, and 802.2 LLC. In LAN mode, connect to SNA gateways, Novell® SAA gateways, Novell SNA gateways, and TN3270 servers. You can run up to 26 sessions.


PC with **MPA 3270 Emulation Board (PCD61C)**
Modem 3400 (MD880A), p. 408
Modem 3400 (MD880A), p. 408
RS-232 Cable (ECM25C), p. 83
LaserJet®
Dialup Line
RS-232 Cable (ECM25C), p. 83
IBM® Mainframe 3270

SPECIFICATIONS

Number of Sessions — PCD62: 5 simultaneous; PCD63: 26 simultaneous
Printer Emulation — 3287 Models 2-5, LU 1 & 3
System Requirements — Cards: ISA bus; PCD62: DOS 3.3 or higher; PCD63: Windows 3.1 Enhanced Mode and DOS 5.0 or higher
Terminal Emulation — 3277, 3278 Models 2–5 full-screen, 3279-2, 3279-6, 3279-536
CE Approval — All items listed are approved
Interface — PCD60C: Type A Coax; PCD61C: RS-232 DTE
Connectors — PCD60C: (1) BNC female; PCD61C: (1) DB25 male
Size — PCD060C, PCD061: 4"H x 5"D (10.2 x 12.7 cm)
Weight — PCD060C, PCD061: 2 lb. (0.9 kg)

Item	Code	Price
3270 Emulation Board		
Coax (Local)	PCD60C	**$395.00**
MPA (Remote)	PCD61C	**$295.00**
OmniPATH		
for DOS	PCD62	**$395.00**
for Windows	PCD63	**$395.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
	For other lengths, see p. 83. Specify gender when ordering.	
Coaxial Cable, 10-ft. (3.0-m) *(IBM® Part #2577672)* PVC	ETN62-0010-BNC	**$9.95**
For plenum applications or other lengths, see p. 79.		

◆ ◆ ◆

3270 Coax Booster

Boost Your Coax Transmissions up to 2400 Feet (730 m).

- **Boost coax transmission range.**
- **Connect in the middle of the cable run for maximum distance.**

The 3270 Coax Booster doubles the typical distance supported by baluns alone over 24 AWG twisted-pair cable (EYN717A). You can boost transmissions up to 2400 feet (731 m)—that's 1200 feet (365 m) to and from the booster.

The 3270 Coax Booster requires Coax↔Twisted Pair baluns at both ends and IBM® 3270 compatible devices that are Type A coax only.

SPECIFICATIONS

Leads Supported — Pins 3 and 4
Maximum Distance — 1200 ft. (365.8 m) each side, over 24 AWG
System Requirements — Low-capacitance UTP cable, Category 3, 4, or 5
Connectors — (2) RJ-11 adapters, (2) 2-screw terminals for twisted pair
Power — 115 VAC; 230-VAC model available on request
Size — 1.4"H x 5.4"W x 3.2"D (3.6 x 13.7 x 8.1 cm)
Weight — 1 lb. (0.5 kg)

BLACK BOX®
CTRL TERM
CTRL
TERM
TX
ITT
IBM
R T R T

NOTE: For maximum distances, locate the Coax Booster in the middle of your cable.

Item	Code	Price
Coax Booster	IC023A	**$360.00**
remember to order cables Bulk Category 5 UTP Solid Cable, 2-Pair PVC	EYN717A	**$.15/ft.**
For plenum applications, see p. 115. For Coax Baluns, see right.		

Coax Baluns Use Inexpensive UTP (Category 3, 4, or 5) Cabling with Your 3270 Coax Equipment.

- **Double-sealed against contaminants.**

NOTE: Balun distances are 1500 feet (460-m), based on Category 3, 4, or 5 UTP cabling.

COAX↔TWISTED-PAIR BALUN (MALE)

Leads Supported — 3, 4
Connectors — (1) BNC male, (1) RJ-11 female, (1) 2-screw terminal
Size — 1"W x 2.8"D (2.5 x 7.1 cm)

RJ-11

Item	Code	Price
Coax↔Twisted-Pair Balun (Male)	IC019A-M	$25.65

COAX↔TWISTED-PAIR BALUN (FEMALE)

Leads Supported — 3, 4
Connectors — (1) BNC female, (1) RJ-11 female, (1) 2-screw terminal
Size — 1"W x 2.8"D (2.5 x 7.1 cm)

RJ-11

Item	Code	Price
Coax↔Twisted-Pair Balun (Female)	IC019A-F	$25.65

COAX↔TWISTED-PAIR BALUN (SCREWS)

Leads Supported — 3, 4
Connectors — (1) BNC male, (1) 2-screw terminal
Size — 0.6"W x 2.3"D (1.5 x 5.8 cm)

Item	Code	Price
Coax↔Twisted-Pair Balun (Screws)	IC002	$19.50

TWINAX↔COAX BALUN

Leads Supported — N/A
Connectors — (1) Twinax male, (1) BNC female
Size — 1"W x 5"D (2.5 x 12.7 cm)

IC009 balun distance is 5000 feet (1524 m) with a twinax host, and 2000 feet (610 m) with a coax host.

Item	Code	Price
Twinax↔Coax Balun	IC009	$61.00

COAX↔TWISTED-PAIR BALUN WITH CABLE

Leads Supported — 3, 4
Connectors — (1) BNC male, (1) RJ-11 male
Size — 1"W x 2.8"D (2.5 x 7.1 cm)

Includes 15-ft. (4.6-m) twisted-pair cable.

RJ-11

Item	Code	Price
Coax↔Twisted-Pair Balun with Cable	IC018A	$30.75

MINI COAX↔TWISTED-PAIR BALUN

Leads Supported — 2, 5
Connectors — (1) BNC male, (1) RJ-11 female
Size — 1.8"H x 1"W x 0.6"D (4.6 x 2.5 x 1.5 cm)

RJ-11

Item	Code	Price
Mini Coax↔Twisted-Pair Balun	IC033	$26.65

MINI COAX↔TWISTED–PAIR BALUN

Leads Supported — 3, 4
Connectors — (1) BNC male, (1) RJ-11 female
Size — 1.8"H x 1"W x 0.6"D (4.6 x 2.5 x 1.5 cm)

RJ-11

Item	Code	Price
Mini Coax↔Twisted-Pair Balun	IC071A	$26.00

MINI COAX↔TWISTED-PAIR BALUN

Leads Supported — 4, 5
Connectors — (1) BNC male, (1) RJ-45 female
Size — 1.8"H x 1"W x 0.6"D (4.6 x 2.5 x 1.5 cm)

RJ-45

Item	Code	Price
Mini Coax↔Twisted-Pair Balun	IC069A	$26.00

MINI COAX↔TWISTED-PAIR BALUN

Leads Supported — 1, 2
Connectors — (1) BNC male, (1) RJ-45 female
Size — 1.8"H x 1"W x 0.6"D (4.6 x 2.5 x 1.5 cm)

RJ-45

Item	Code	Price
Mini Coax↔Twisted-Pair Balun	IC070A	$26.00

◆ ◆ ◆

3270 Repeaters Noise-Filtered Signals Go 8200 Feet (2500 m) on Fiber, Repeater to Repeater.

- Resynchronize and reformat data.
- Daisychain for greater distances.
- Total distance is 5000 feet (1525 m) over copper, or 11,200 feet (3410 m) over fiberoptic cable.

NOTE: Check with your MIS manager about your equipment's timeout requirements before ordering.

Item		Code	Price
3270 Repeaters			
Fiber	RJ-11	IC051	$770.00
	RJ-45	IC078A	$770.00
UTP	RJ-11	IC056	$615.00
	RJ-45	IC077A	$615.00
19" Rackmount Plate		IC055	$52.00

remember to order cables

For RJ-11 models:

Item	Code	Price
Bulk Category 5 UTP Solid Cable, 2-Pair PVC	EYN717A	$.15/ft.

For plenum applications, see p. 115.

For RJ-45 models:

Item	Code	Price
Category 5 Solid Conductor Cable, 4-Pair 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	$10.95

For other lengths and pinnings, see p. 68.

SPECIFICATIONS

Maximum Distance — IC051, IC078A: Controller to Repeater: 1500 ft. (457 m); Repeater to Repeater: 8200 ft. (2500 m); Repeater to Workstation: 1500 ft. (457 m); IC056, IC077A: Controller to Repeater: 1500 ft. (457 m); Repeater to Repeater over UTP cable: 2000 ft. (610 m); Repeater to Workstation: 1500 ft. (457 m)

Connectors — IC051: (1) RJ-11 6-wire modular jack, (2) screw terminals, (2) AT&T® ST®; IC078A: (1) RJ-45 8-wire modular jack, (2) screw terminals, (2) AT&T ST; IC056: (2) RJ-11 6-wire modular jacks, (4) screw terminals; IC077A: (2) RJ-45 8-wire modular jacks, (4) screw terminals

Power — 115 VAC, 60 Hz; 230-VAC, 50-Hz version on request

Size — 1.3"H x 8.5"W x 4"D (3.3 x 21.6 x 10.2 cm)

LinkUp 5250 and 3270

Link Your PCs and Printers to Your IBM Host.

AS/400
Interface

Back of LinkUp Base Unit (PCM90A) with added expansion board (not included).

LinkUp 5250

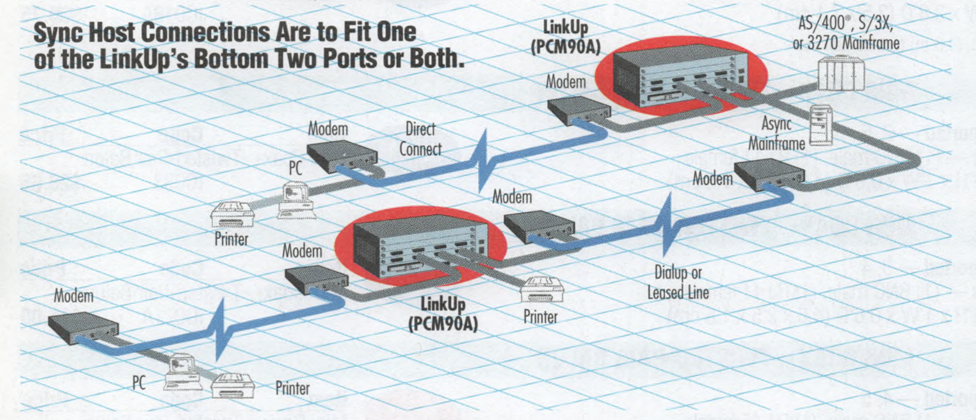
- **Give virtually any ASCII device access to your IBM midrange host.**

The BLACK BOX® LinkUp 5250 translates AS/400® or System 3X synchronous EBCDIC to async ASCII—and ASCII to EBCDIC. It also gives you async passthrough from terminals to async host ports. For local access, plug the LinkUp directly into the communications adapter on your AS/400 or System/3X (**see diagram**). For remote access, connect your leased lines or dialup modems to the LinkUp. In both applications, you can connect up to 32 users when you install four of the 8-Port RS-232 Boards. The 5250 DOS and Windows® Emulation software option (PC058A-R2 and PC059A) enables your PC to communicate with the LinkUp 5250 Base Unit.

LinkUp 3270 (BSC or SNA)

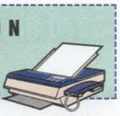
- **Use your ASCII devices in your IBM 3270 environment.**

The BLACK BOX® LinkUp 3270 enables async passthrough from terminals to async host ports. You get two levels of emulation: Your ASCII terminals and printers talk with a 3270 mainframe, and the LinkUp 3270 can emulate the 3X74 controller. Use either BSC or SNA protocol to communicate with the host—see the price chart **below** to select the LinkUp you need. Attached terminals are treated as IBM® 3278 terminals (LU Type 2). Printers are treated as IBM 3287 printers (LU Type 1 or 3). With the PC Software LinkUp (PCM77-R2), your PC can communicate with the Base Unit, and you can run IND$ file transfers.



Sync Host Connections Are to Fit One of the LinkUp's Bottom Two Ports or Both.

FAXBACK INFORMATION
Request Document Number: 10793
Call 412-746-5500 Anytime



SPECIFICATIONS

For all LinkUp Base Units:

Emulation — LinkUp 5250:
Controllers: 5251-12, 5294, 5394;
Terminals: 5251-11, 5291, 5292;
Printers: 5224/25/56;
LinkUp 3270 BSC, LinkUp 3270 SNA:
Controller: 3X74;
Terminals: (SNA or BSC) 3278, 3178, 3179;
Printers: (SNA or BSC), 3287

Protocol — LinkUp 5250: 5250 SNA/SDLC;
LinkUp 3270 BSC: 3270 bisync;
LinkUp 3270 SNA: 3270 SNA/SDLC

Speed — Terminals and Printers: to 19.2 Kbps

CE Approval — PCM82-C, PCM84-C, PCM90A

Interface — (2) RS-232 DTE/DCE-selectable;
Host: Synchronous RS-232;
Users: Asynchronous RS-232 or RS-530

Connectors — Base Unit: (2) DB25 female, sync

Power — 115/230 VAC, 60/50 Hz

Size — 6"H x 16.8"W x 11"D (15.2 x 42.7 x 27.9 cm)

Weight — 17 lb. (7.7 kg)

NOTE: Select Firmware and one or more async boards to customize the PCM90A according to your requirements.

LinkUp 5250

Item	Code	Price
LinkUp Base Unit	PCM90A	**$1745.00**
5250 Firmware	PCM91-R2	**$300.00**
4-Port RS-232 Board—DB25	PCM82-C	**$1025.00**
4-Port RS-530 Board—DB25	PCM83-C	**$1025.00**
8-Port RS-232 Board—DB9	PCM84-C	**$2050.00**
5250 DOS Emulation Softwr.	PC058A-R2	**$150.00**
5250 Windows Em. Softwr.	PC059A	**$245.00**

LinkUp 3270 BSC

Item	Code	Price
LinkUp Base Unit	PCM90A	**$1745.00**
3174 BSC Firmware	PCM71	**$310.00**
4-Port RS-232 Board—DB25	PCM82-C	**$1025.00**
4-Port RS-530 Board—DB25	PCM83-C	**$1025.00**
8-Port RS-232 Board—DB9	PCM84-C	**$2050.00**
PC Software—LinkUp	PCM77-R2	**$200.00**

LinkUp 3270 SNA

Item	Code	Price
LinkUp Base Unit	PCM90A	**$1745.00**
3174 SNA Firmware	PCM92	**$310.00**
4-Port RS-232 Board—DB25	PCM82-C	**$1025.00**
4-Port RS-530 Board—DB25	PCM83-C	**$1025.00**
8-Port RS-232 Board—DB9	PCM84-C	**$2050.00**
PC Software—LinkUp	PCM77-R2	**$200.00**

remember to order cables

For the 4-Port RS-232 Board:

Item	Code	Price
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83. Specify gender when ordering.

For the 8-Port RS-232 Board:

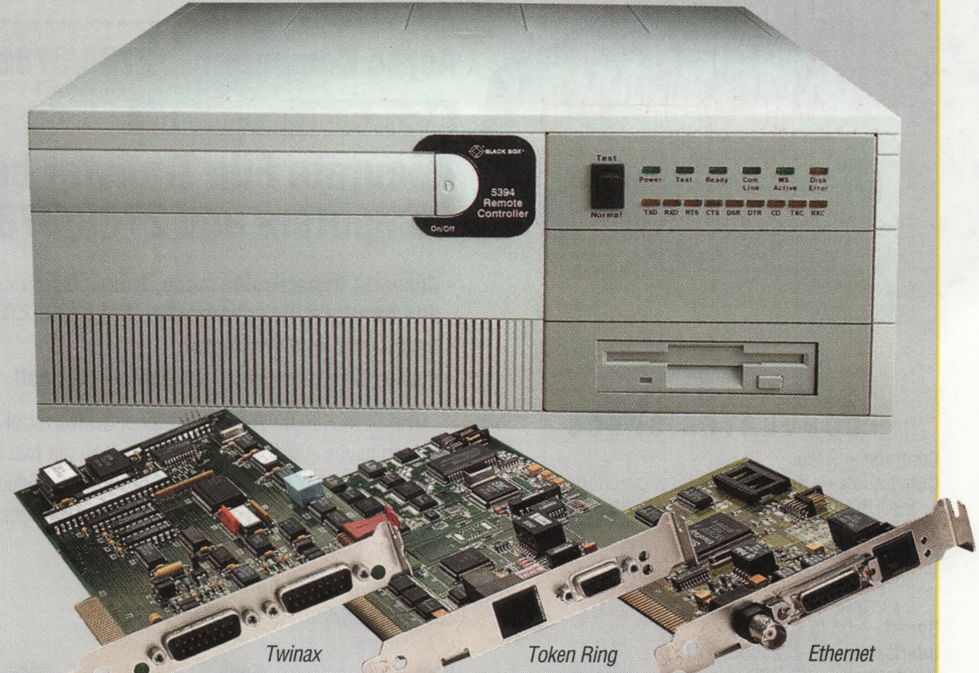
Item	Code	Price
AT® Premium Modem Cable, 10-ft. (3.0-m)	EVMBMC-0010	**$19.95**

For other lengths, see p. 109.

• NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $ •

5394 Remote Controller

Attach Your LAN and Twinax Devices Remotely to Your AS/400.


BLACK BOX
5394 Remote Controller
On/Off
Test
Normal
Power
Test
Ready
Com Line
WS Active
Disk Error
TXD RXD RTS CTS DSR DTR CD TXC RXC
Twinax
Token Ring
Ethernet

- **Modular Design: Install one Ethernet or Token Ring and up to six Twinax Cards as you need them.**
- **Compatible with IBM 5294 and 5394 (and limited support for 5494).**
- **Supports IBM features: enhanced PC keyboard layout, DisplayWrite®/36, PC Support, OfficeVision/400™, RUMBA®, IPDS™ printing, and more.**

The BLACK BOX® 5394 Remote Controller provides all the connections you need for your AS/400®.

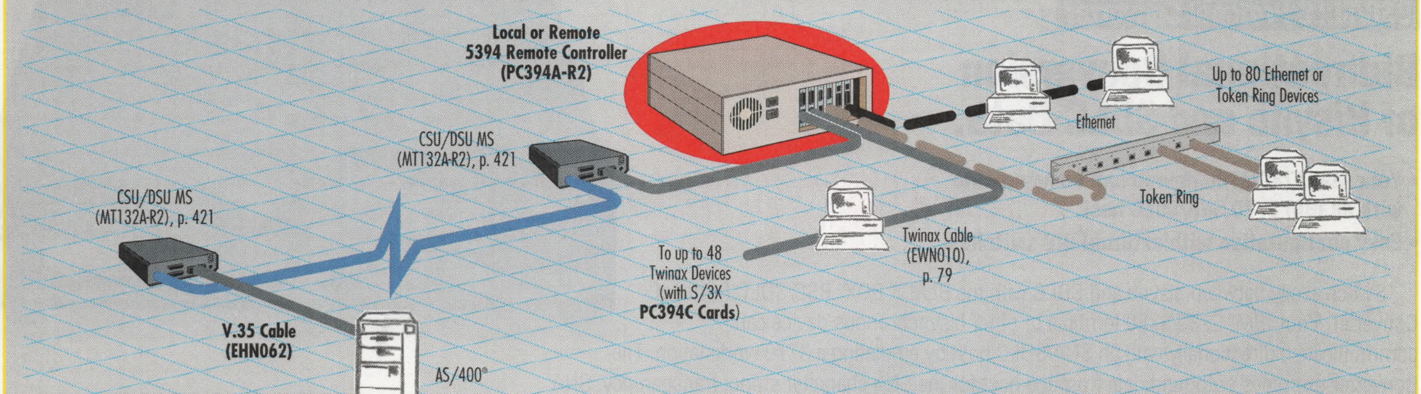
You can connect locally or remotely to your communications line and establish a twinax and an Ethernet or Token Ring connection to your AS/400.

You can match the Remote Controller's capacity to your network's growth—without changing controllers.

NOTE: The LAN connection is a link to the AS/400, not a gateway between the LAN workstations and the 5250 workstations. The 5394 Remote Controller supports Client Access for AS/400.

SPECIFICATIONS

Emulation — IBM® 5294 or 5394
Line Speed — Up to 64 Kbps
System Compatibility — IBM AS/400, System 38 or System 36
CE Approval — PC394C–PC396C; 230-VAC version: PC394AE-R2
Interface — X.21, RS-232, V.35
Power — 115 or 230 VAC, 200 watts
Size — 6.5"H x 14.3"W x 16.3"D (16.5 x 36.3 x 41.4 cm)
Weight — 27 lb. (12.3 kg)


Local or Remote
5394 Remote Controller
(PC394A-R2)
CSU/DSU MS
(MT132A-R2), p. 421
CSU/DSU MS
(MT132A-R2), p. 421
Up to 80 Ethernet or
Token Ring Devices
Ethernet
Token Ring
Twinax Cable
(EWN010),
p. 79
To up to 48
Twinax Devices
(with S/3X
PC394C Cards)
V.35 Cable
(EHN062)
AS/400®

Item	Code	Was	Price
5394 Remote Controller	PC394A-R2	~~$1595.00~~	$1345.00
5394 Twinax Expansion Card	PC394C	~~$945.00~~	$845.00
5394 Token Ring Card	PC395C	~~$1875.00~~	$1595.00
5394 Ethernet Card	PC396C	~~$1875.00~~	$1095.00

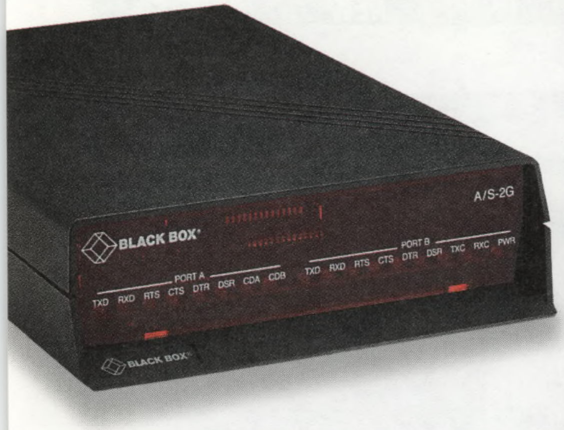
remember to order cables

You will need one of these cables...

For modem connections:		
X.21 Cable for PC394A-R2	EHN060-0020	**$50.00**
RS-232 Cable for PC394A-R2	EHN061-0020	**$50.00**
V.35 Cable for PC394A-R2	EHN062-0020	**$50.00**
For direct connections:		
X.21 M.E. Cable for PC394A-R2	EHN063-0020	**$50.00**
RS-232 M.E. Cable for PC394A-R2	EHN064-0020	**$50.00**
V.35 M.E. Cable for PC394A-R2	EHN065-0020	**$50.00**

Black Box Gives *New* Life to

Our Protocol Converters Support an Array of


BLACK BOX
A/S-2G
PORT A
TXD RXD RTS CTS DTR DSR CDA CDB
PORT B
TXD RXD RTS CTS DTR DSR TXC RXC PWR
BLACK BOX

Async Computers↔2780/3780 Mainframes

A/S-2G Protocol Converter

Accurate File Transfer between Async Computers and 2780/3780 Mainframes.

- **Converts transmission mode, transmission code, communications protocol, and transmission speed under IBM 2770, 2780, 3741, and 3780 protocols.**
- **Built-in modem eliminator.**
- **Customized converters available—just call.**

The BLACK BOX® A/S-2G Protocol Converter gives you *the* most accurate bidirectional conversions between async ASCII and 2780/3780. You get two bidirectional RS-232 ports—one async, one bisync.

The Converter can supply synchronous clocking at speeds up to 19.2 Kbps. Edit-option switches enable you to configure parameters like echo async character, echo EOT, and more.

NOTE: For a 3780-transparent version, call Tech Support at ***412-746-5500****.*

FAXBACK INFORMATION
Request Document Number: 10968
Call 412-746-5500 Anytime

CONVERTER SPECS

Controls — Reset
Conversion — Bidirectional: Bisynchronous EBCDIC (2770, 2780, 3741, or 3780 protocols) to asynchronous ASCII
Flow Control — X-ON/X-OFF or DTR/CTS async flow control; standard BSC handshaking for bisynchronous control
Speed — Up to 19.2 Kbps
Interface — RS-232, both ports
Connectors — (2) DB25 female
Indicators — Power, TXD, RXD, RTS, CTS, DTR, DSR, TXC, RXC, CD for both ports
Power — 115 VAC, 60 Hz (with wallmount transformer), 63 watts
Size — 2.1"H x 8.8"W x 11.5"D (5.3 x 22.4 x 29.2 cm)
Weight — 3.5 lb. (1.6 kg)

Item	**Code**	**Price**
A/S-2G Protocol Converter (2780/3780) (Includes Standard, Non-Transparent Firmware)	PCW22A-R3	**$1495.00**
A/S-2G Board	PCW22C-R2	**$1495.00**
8-Card Rack (**p. 326**)	RM060	**$425.00**
11-Card Rack (48-VDC) (**p. 326**)	RM062A	**$775.00**

Item	**Code**	**Price**
Remember to order the right synchronous modem for your Converter...		
Modem 201 BC/AS (**p. 409**)	MD796A	**$705.00**
Modem 32144 (AC Powered (**p. 408**)	MD833A-R5	**$795.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.
Specify gender when ordering.

◆ ◆ ◆

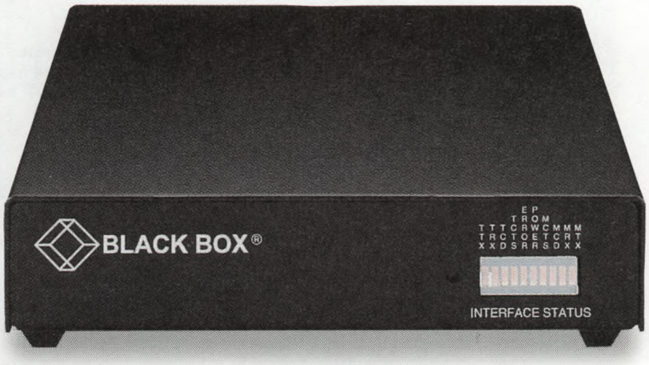
BSC/SDLC Protocol Converter

Bidirectional Conversion of Bisync and SDLC Data.

- **Your IBM 2780/3780 device can communicate with an IBM 3770 SNA/SDLC host.**
- **Easy configuration with external DIP switches.**

Switch easily between bisync and SDLC with the BLACK BOX® BSC/SDLC Protocol Converter. Your IBM® 2780/3780 terminal or other bisynchronous device can communicate bidirectionally with an SNA/SDLC host by emulating a 3770 workstation. The Converter examines outbound data from the host for the SNA character string, transparency, SNA compression, and the use of string control bytes (SCBs). The Converter converts it to bisync, then transmits it to the 2780/3780 terminal or other compatible device. It runs at speeds of up to 9600 bps over point-to-point, multipoint, or switched lines.

Both ports can be configured as either DTE or DCE, with external DIP switches. You select NRZI or NRZ—and internal or external clocking. Bisync port supports 2780 or 3780 protocols. SNA port supports 3770 only.



SPECIFICATIONS

Speed — 600, 1200, 1800, 2200, 2400, 4800, and 9600 bps
Interface — RS-232 DTE/DCE selectable
Connectors — (2) DB25 female
Indicators — (10) LEDs: Power, Error, MCTS, MCD, MRX, MTX, TCTS, TCD, TRX, and TTX
Power — 115 VAC, 60 Hz (with wallmount transformer), 10 watts, (230-VAC version on request)
Size — 1.5"H x 6.5"W x 8.3"D (3.8 x 16.5 x 21.1 cm)
Weight — 3 lb. (1.4 kg)

Item	**Code**	**Price**
BSC/SDLC Protocol Converter	PC007A	**$1750.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83. Specify gender when ordering.

Your Existing Mainframe Systems!

Protocols within Your Mainframe Environment.

Async Computers↔3270 or 3770 RJE SNA/SDLC Mainframes

A/S-4 Protocol Converter

Local or Remote ASCII Access to Your SDLC System.

- **Your ASCII terminals, printers, PCs, or async hosts can work in your SNA/SDLC system from anywhere!**
- **Easy to configure—use DIP-switch bank or menu-driven display on your terminal.**

SPECIFICATIONS

Speed — 600, 1200, 1800, 2200, 2400, 4800, and 9600 bps
CE Approval — 230-VAC version: PC006A–E
Interface — RS-232 DTE/DCE selectable
Connectors — (2) DB25 female
Indicators — (10) LEDs: Power, Error, MCTS, MCD, MRX, MTX, TCTS, TCD, TRX, and TTX
Power — 115 VAC, 60 Hz (with wallmount transformer), 10 watts, (230-VAC version on request)
Size — 1.5"H x 6.5"W x 8.3"D (3.8 x 16.5 x 21.1 cm)
Weight — 3 lb. (1.4 kg)

The BLACK BOX® A/S-4 offers multiple features so your ASCII devices can access your SDLC system. The A/S-4 operates over point-to-point, multipoint, or switched SDLC lines. The A/S-4 can operate in interactive or batch mode.

Direct Operation

A built-in modem eliminator can supply the sync clocking. You select the rates—up to 9600 bps. Or, attach your own async device directly.

Remote Operation

The A/S-4 attaches to a sync modem (dialup or leased-line) to send data between your mainframe and an IBM® FEP or equivalent. It's switch-selectable for NRZI or NRZ.

Item	Code	Price
A/S-4 Protocol Converter	PC006A	**$1550.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83. Specify gender when ordering.

BPS/BSA Protocol Converter

Add Nonstandard Terminals to Your Burroughs or UNISYS® Network.

- **Performs either Burroughs® Poll-and-Select (BPS) conversion or Sync↔Async (BSA) conversion.**

Burroughs Poll-and-Select (BPS)

With BPS Conversion, an asynchronous (ASCII-TTY) unit can talk with a Burroughs® polling system (TDI or RS-232 BPS async or sync).

Burroughs Sync↔Async (BSA) Conversion

With Burroughs Sync↔Async (BSA) Conversion, your synchronous Burroughs host can communicate with any asynchronous Burroughs compatible unit. The BPS/BSA acts as the interface.

Item	Code	Price
Burroughs Poll and Select/Sync↔Async Converter (BPS/BSA)	PCB27A	**$1300.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83. Specify gender when ordering.

SPECIFICATIONS

Buffer Control — X-ON/X-OFF or CTS/DTR for buffer flow control
Speed — 300, 600, 1200, 1800, 2400, 4800, and 9600 bps
CE Approval — 230-VAC version: PCB27A–E
Interface — RS-232 DTE/DCE-selectable or Burroughs TDI
Connectors — (2) DB25 female
Indicators — (10) LEDs: Power, Error, MCTS, MCD, MRX, MTX, TCTS, TCD, TRX, and TTX
Power — 115 or 230 VAC (with wallmount transformer), 60 or 50 Hz ±5%, 10 watts
Size — 1.5"H x 6.5"W x 8.5"D (3.8 x 16.5 x 21.6 cm)
Weight — 3 lb. (1.4 kg)

IPDS External Printer Interface

IPDS Printer Emulation for Laser Printers!

- **IBM 4028 printer emulation.**
- **Multihost printer-sharing.**
- **Supports all IPDS formats.**
- **Can be used in twinax or coax environments.**

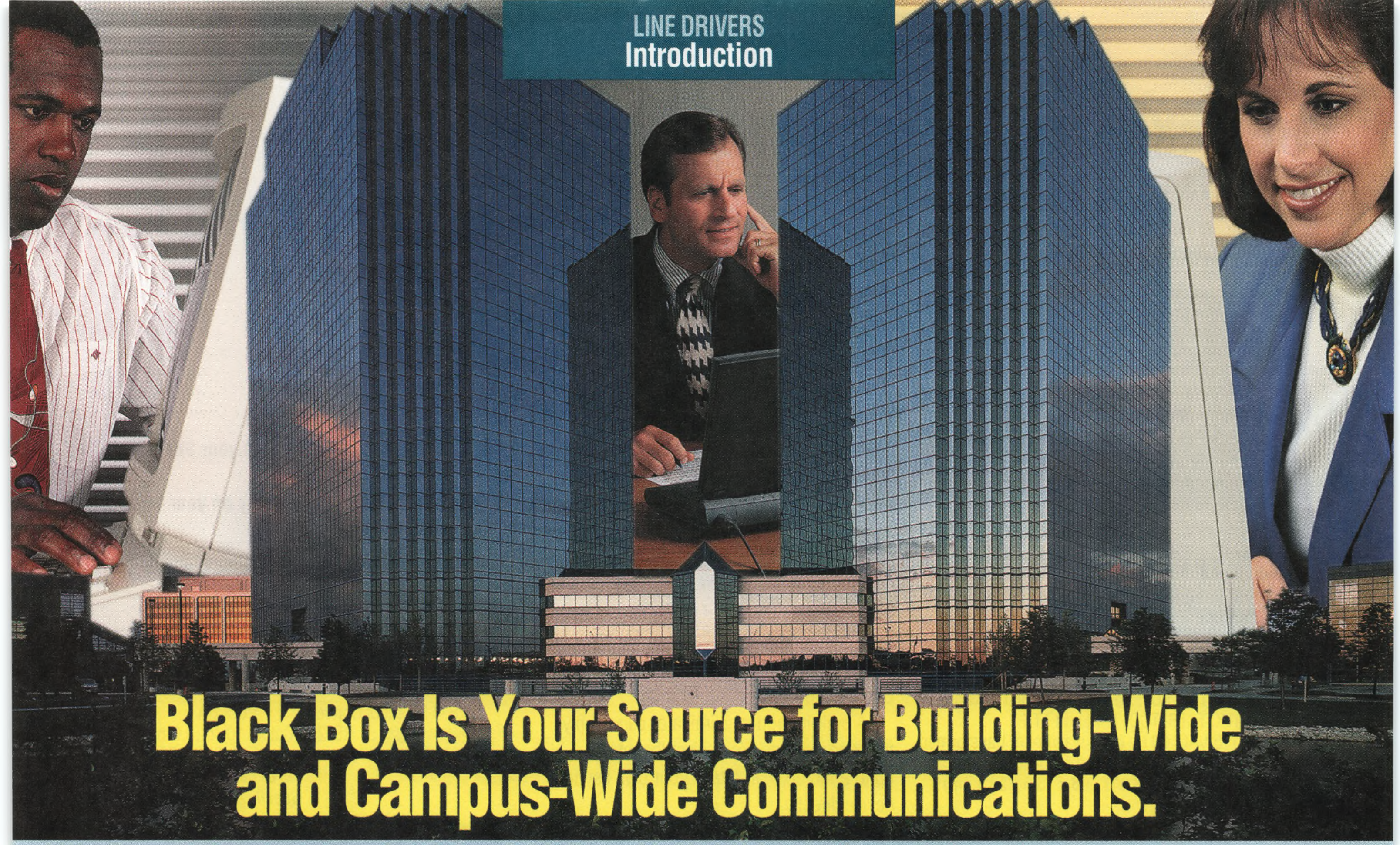
This Printer Interface from Black Box enables you to connect your HP® LaserJet® or any HP PCL® Level 5 laser printer to an IBM System 3X, AS/400®, or 3270 mainframe. With this Interface, your printer can emulate an IBM 4028 laser printer. The Interface takes input from twinax or coax, RS-232 serial, and Centronics® parallel, and provides automatic switching of output to Centronics parallel or RS-232 serial.

CE Approval — Yes

Item	Code	Price
IPDS External Printer Interface	PCD70A	**$1995.00**
remember to order cables Centronics Cable, 6-ft. (1.8-m)	BC00201	**$8.95**

More lengths and genders, see p. 106.

FAXBACK INFORMATION
Request Document Number: 12575
Call 412-746-5500 Anytime



Black Box Is Your Source for Building-Wide and Campus-Wide Communications.

We're the Source for UTP and Fiber Solutions!

Not everyone has the same cabling. Or uses the same interface. That's why Black Box offers you a wide variety of modem eliminators, UTP line drivers, and fiber line drivers. Put these solutions to work for you—whatever your application.

Drive the Distance.

Line drivers (a.k.a. short-haul modems) give you extra distance on lines within a building. They can connect async terminals to host computers or terminal servers.

Multipoint line drivers enable your industrial slave devices to communicate with a master device over long distances.

And you can integrate your legacy equipment into a campus environment with V.35 Line Drivers.

Most line drivers use inexpensive UTP wiring. You may already have the right cable installed!

Line drivers are available in standalone models, appropriate for connecting individual devices, and rackmount models, suitable for large central sites (see our MicroRACK System on **pages 378–379**).

Keep Your Guard Up.

And because extra distance on your copper data cables leaves your systems more vulnerable to electrical harm, many of our line drivers are available with surge protection or optical isolation.

Surge protection guards your equipment against damage caused by surges and spikes on your data line.

Opto-isolation protects your data lines against ground loops, which can occur on long cable runs and when you run cable between buildings.

Optional Built-in SURGE PROTECTION

Fiber à la Mode.

Topping off this section are our fiber line drivers. They can handle high-speed LAN transmissions and give you extra distance between bridges or routers.

Industrial Fiber Driver

Fiber cable gives you far more distance than twisted-pair cable. And it's immune to surges and electrical noise of all kinds—including nearby lightning strikes and ground loops.

Our fiberoptic line drivers give you the most versatile performance. They are designed for environments that are too electrically noisy for a standard driver using UTP. So you'll get faster speeds and more distance!

Any Questions?

Call the Black Box Technical Support Team at **412-746-5500**. We're here for you 24 hours a day, seven days a week.

BLACK BOX SOLUTIONS

7000 Connectivity Solutions…

"Trespassers are breaching our base's perimeter more and more. We need better security."

The Problem:

A large military testing facility in the southwestern United States needed additional security-monitoring posts along its perimeter. But the perimeter was huge—several thousand square miles huge. With a territory that size, perimeter breaches were frequent, sometimes simultaneous, events. And the facility was looking for a solution which would enable them to respond as needed.

The Solution:

A procurement officer at the testing facility gave us a call. "All kinds of curious people are *always* trying to get in. Can Black Box help us?"

One of our Technical Support Experts had the answer. "Sounds like you could use several Async Short-Haul Modems," she said. "They're ideal for connecting security-monitoring terminals at guard stations to your security system. The extra distance supported by the Short-Haul Modems gives you the flexibility to place security stations where they're needed most so you can properly respond to any perimeter breach."

The officer at the testing facility ordered several Async Short-Haul Modems and 8-Card Desktop Racks. And thanks to Black Box's same-day shipping, the base had its products the next day and installed them quickly. See **pages 366–367** to find out more about the Short-Haul Modem-B Async Solution.

IN THIS SECTION…

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RS-232/Copper ………… 364–376
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Async, Point-to-Point, AC-Powered ….. 366–367
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High-Speed Copper ……… 380–385
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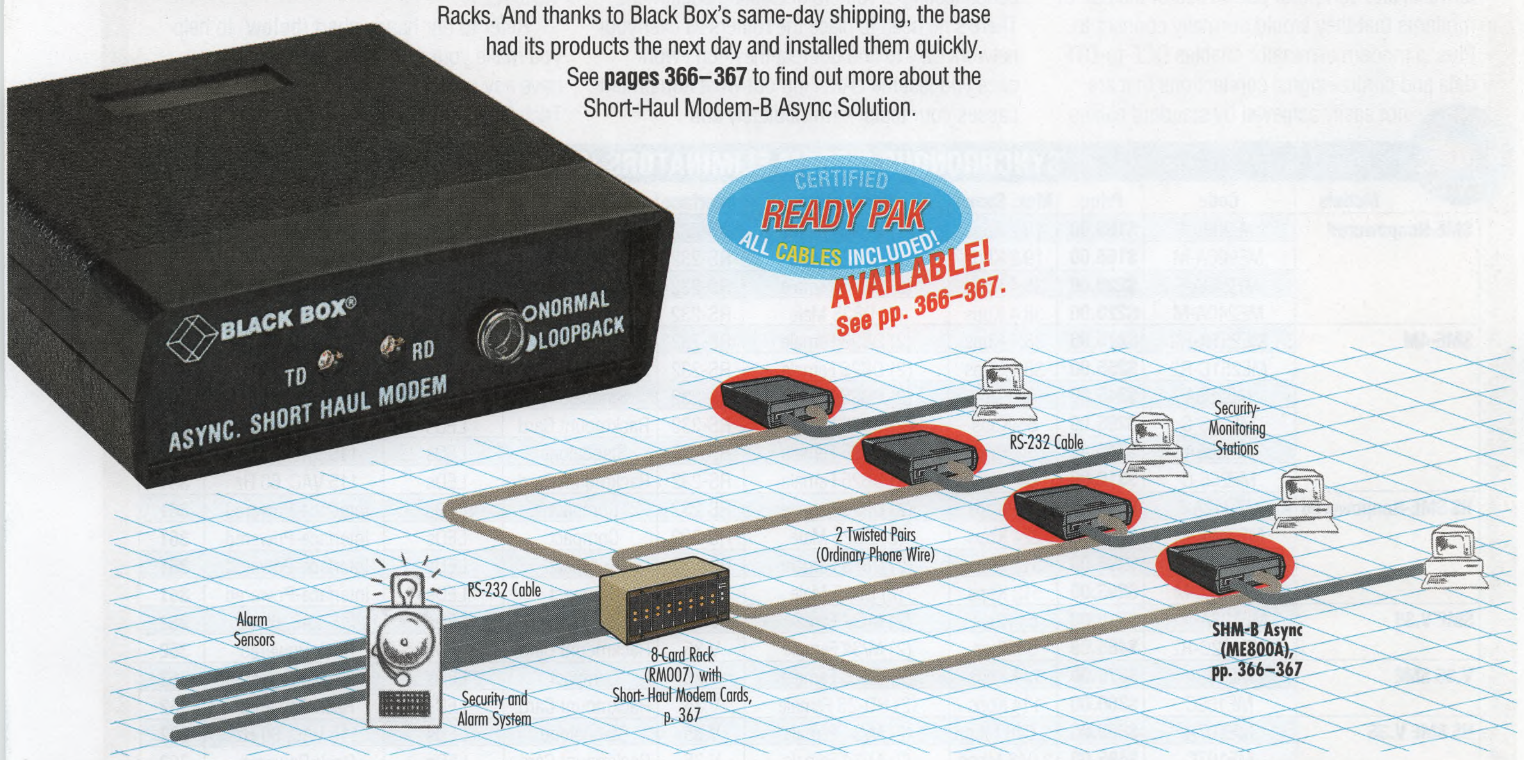
BLACK BOX
TD
RD
NORMAL
LOOPBACK
ASYNC. SHORT HAUL MODEM
Security-Monitoring Stations
RS-232 Cable
2 Twisted Pairs (Ordinary Phone Wire)
RS-232 Cable
Alarm Sensors
Security and Alarm System
8-Card Rack (RM007) with Short-Haul Modem Cards, p. 367
SHM-B Async (ME800A), pp. 366–367

CERTIFIED **READY PAK** ALL CABLES INCLUDED!
AVAILABLE!
See pp. 366–367.

FOR *FAST* TECH SUPPORT,
Call **412-746-5500**

PRESS **1,2,3** COMMUNICATIONS
Modems, CSU/DSUs, ISDN, T1, X.25/Frame Relay, Muxes/Line Sharing, **Line Drivers**, Video & Multimedia, PC Communications/Accessories

Or if You Prefer:
Fax Us at: 412-746-0746.
E-mail Us at: info@blackbox.com

VIPreview
Ask for our **Short-Haul Modems VIPreview.**

Everything You Need for Any Application PLUS a FREE Poster-Sized Data-Transmission Guide (Modems and Line Drivers).

DRIVERS

Modem Eliminators: What Do They Really Do?

Understanding the Process of Elimination.

We sometimes hear this from our customers: "I purchased a dozen modems from Black Box a month ago so my workgroup can connect to the Internet. Why should I now buy a product that eliminates them?"

Well, perhaps it's time for clarification.

The modems you purchased from us for Internet-access and remote-access applications are *not* being eliminated. In fact, we hope you continue to buy many, many more of them.

But if your office environment has sync equipment, and if that equipment is also used for local data communications, you should consider replacing those modems with cost-effective and versatile modem eliminators.

What Does a Modem Eliminator Do?

One modem eliminator can connect a local terminal and computer port in lieu of the *pair* of modems that they would normally connect to. Plus, a modem eliminator enables DCE-to-DTE data and control-signal connections that are not easily achieved by standard cables or connectors in a synchronous environment.

Basically, a modem eliminator simulates a sync data link. It does this two ways: First, it provides clocking, which is mandatory for sync devices to communicate. Second, it provides the handshaking that DCEs do.

Why Should You Use a Modem Eliminator?

One—if you have two sync DTEs in the same room or close proximity to each other, you will need a modem eliminator.

Say, for example, that two offices were consolidated in your company. After the move, a remote controller and all its users must be linked to a front-end processor. You can connect the two sync DTEs with a modem eliminator.

Two—if you have a network with routers, you just found the perfect equipment tester.

A modem eliminator can enable in-house bench testing of routers or existing equipment. There's no need to place the routers all over your network only to find out that they don't work once you test the LAN. Find out what equipment passes your tests—immediately and conveniently before installation—with a modem eliminator.

Three—a modem eliminator makes good economic sense. One does the job of two modems—and it does the job better. You get a high return on your investment.

Which Modem Eliminator Is Right for You?

You may be concerned about half- or full-duplex operation. Or maybe how far a modem eliminator drives data. But the *most important* specs to consider when you're making a purchasing decision are **speed** and **interface**.

At Black Box, we have modem eliminator models that send data from 19.2 Kbps to as fast as 512 Kbps and even up to 2.048 Mbps. Modem Eliminators fulfill your need for speed.

And we have the right devices to match your interfaces—RS-232, RS-422, RS-530, V.35, X.21.

Refer to our handy chart (**below**) to help you make your purchasing decision. If you have any questions, just call our 24-hour Tech Support at **412-746-5500**.

SYNCHRONOUS MODEM ELIMINATORS (SMEs)

Models	Code	Price	Max. Speed	Connectors	Interface	Style	Diagnostics	Power	Page
SME-Nonpowered	ME900A-F	**$165.00**	19.2 Kbps	(2) DB25 Female	RS-232	Compact	LEDs	Interface-Powered	**361**
	ME900A-M	**$165.00**	19.2 Kbps	(2) DB25 Male	RS-232	Compact	LEDs	Interface-Powered	**361**
	ME240A-F	**$220.00**	38.4 Kbps	(2) DB25 Female	RS-232	Compact	LEDs	Interface-Powered	**361**
	ME240A-M	**$220.00**	38.4 Kbps	(2) DB25 Male	RS-232	Compact	LEDs	Interface-Powered	**361**
SME-4M	ME251A-R2	**$275.00**	38.4 Kbps	(2) DB25 Female	RS-232	Standalone	LEDs	115 VAC, 60 Hz	**361**
	ME251C-R2	**$255.00**	38.4 Kbps	(2) DB25 Female	RS-232	Rackmount Card	LEDs	115 VAC, 60 Hz	**361**
	ME253A	**$345.00**	56 Kbps	(2) DB25 Female	RS-232	Standalone	LEDs	115 VAC, 60 Hz	**361**
	ME253-C	**$295.00**	56 Kbps	(2) DB25 Female	RS-232	Rackmount Card	LEDs	115 VAC, 60 Hz	**361**
	ME255A	**$345.00**	64 Kbps	(2) DB25 Female	RS-232	Standalone	LEDs	115 VAC, 60 Hz	**361**
	ME255-C	**$310.00**	64 Kbps	(2) DB25 Female	RS-232	Rackmount Card	LEDs	115 VAC, 60 Hz	**361**
HS SME-Nonpowered	ME242A-F	**$295.00**	224 Kbps	(2) DB25 Female	RS-232	Compact	LEDs	Interface-Powered	**361**
	ME242A-M	**$295.00**	224 Kbps	(2) DB25 Male	RS-232	Compact	LEDs	Interface-Powered	**361**
	ME241A -F	**$295.00**	512 Kbps	(2) DB25 Female	RS-232	Compact	LEDs	Interface-Powered	**361**
	ME241A-M	**$295.00**	512 Kbps	(2) DB25 Male	RS-232	Compact	LEDs	Interface-Powered	**361**
SME V.35	ME102A-R2	**$510.00**	64 Kbps	(2) M/34 Female	V.35	Standalone	LEDs	115 VAC, 60 Hz	**362**
	ME102C-R2	**$465.00**	64 Kbps	(2) M/34 Female	V.35	Rackmount Card	LEDs	Rack-Powered	**362**
V.35 SME	ME109A	**$375.00**	144 Kbps	(2) DB25 Female	V.35	Compact	LEDs	Interface-Powered	**362**
	ME109C	**$360.00**	144 Kbps	(2) HD-26 Female	V.35	Rackmount Card	LEDs	Rack-Powered	**362**
HS SME V.35	ME107A	**$600.00**	2.048 Mbps	(2) M/34 Female	V.35	Standalone	LEDs	115 VAC, 60 Hz	**362**
	ME107C	**$495.00**	2.048 Mbps	(2) M/34 Female	V.35	Rackmount Card	LEDs	Rack-Powered	**362**
	ME108A	**$520.00**	2.048 Mbps	(2) DB25 Female	V.35	Standalone	LEDs	115 VAC, 60 Hz	**362**
	ME108C	**$395.00**	2.048 Mbps	(2) DB25 Female	V.35	Rackmount Card	LEDs	Rack-Powered	**362**
SME 422	ME101A-R2	**$405.00**	448 Kbps	(2) DB37 Female	RS-422	Standalone	LEDs	115 VAC, 60 Hz	**363**
	ME101-C	**$340.00**	448 Kbps	(2) DB37 Female	RS-422	Rackmount Card	LEDs	115 VAC, 60 Hz	**363**
SME 530	ME103A-R2	**$335.00**	448 Kbps	(2) DB25 Female	RS-530	Standalone	LEDs	115 VAC, 60 Hz	**362**
	ME103C-R2	**$310.00**	448 Kbps	(2) DB25 Female	RS-530	Rackmount Card	LEDs	115 VAC, 60 Hz	**362**
SME X.21	ME131A-F	**$527.00**	56 Kbps	(2) DB15 Female	X.21	Compact		115 VAC, 60 hz	**363**
	ME131A-M	**$527.00**	56 Kbps	(2) DB15 Male	X.21	Compact		115 VAC, 60 Hz	**363**
	ME132A-F	**$527.00**	64 Kbps	(2) DB15 Female	X.21	Compact		115 VAC, 60 Hz	**363**
	ME132A-M	**$527.00**	64 Kbps	(2) DB15 Male	X.21	Compact		115 VAC, 60 Hz	**363**
	ME130C	**$360.00**	144 Kbps	(2) HD-26 Female	X.21	Rackmount Card	LEDs	Rack-Powered	**362**
	ME121A	**$335.00**	1.544 Mbps	(2) DB15 Female	X.21	Compact		Interface-Powered*	**363**

* Optional power supply available.

Synchronous Modem Eliminators—Nonpowered (SME-NPR)

Easy RS-232 Connections.

- **Nonpowered units plug right in.**
- **Run cable up to 150 feet between DTEs.**
- **Emulate dialup or dedicated modem service.**

We've added two high-speed models to our popular line of SME-NPRs: The speedy SME-NPR (512 Kbps) supports selectable sync data rates from 16 to 512 Kbps—including 64 Kbps. Sync data rates for the SME-NPR (224 Kbps) zip along from 7 to 224 Kbps, including 56 Kbps.

Select either unit's two RTS-CTS delay options for emulated dialup or dedicated modem service.

FAXBACK INFORMATION
Request Document Number: 15750
Call 412-746-5500 Anytime

SPECIFICATIONS

Maximum Distance — Up to 150 ft. (45.7 m) (DTE to DTE)
CE Approval — ME240A–242A
Power — From the RS-232 interface

PORT 1
PORT 2

ME240A

Item		Code	Price
High-Speed Sync Modem Eliminators—Nonpowered			
512 Kbps	Male	ME241A-M	**$295.00**
	Female	ME241A-F	**$295.00**
224 Kbps	Male	ME242A-M	**$295.00**
	Female	ME242A-F	**$295.00**
Synchronous Modem Eliminator—Nonpowered			
38.4 Kbps	Male	ME240A-M	**$220.00**
	Female	ME240A-F	**$220.00**
19.2 Kbps	Male	ME900A-M	**$165.00**
	Female	ME900A-F	**$165.00**

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Synchronous Modem Eliminator (SME-4M) for RS-232

IBM Compatibility at Three Different Speeds.

- **Three models: 38.4, 56, and 64 Kbps.**
- **Rackmount version is available.**

We've tailored our SME-4M for your IBM® equipment. Use one of these to provide clocking to your system, instead of a pair of modems or line drivers to connect controllers or other systems to your front-end processor. Choose the SME-4M with the speed you need.

The SME-4M regenerates the RS-232 signals so you can send them up to 100 feet (30.5 m)—and put sync devices where you want them. You can monitor the operating status easily with a glance at the front-panel LEDs.

SPECIFICATIONS

Operations — Half- or full-duplex
Protocol — Synchronous or asynchronous
Speed — Up to 38.4, 56, or 64 Kbps
CE Approval — ME251C-R2, ME253A, ME253-C, ME255A, ME255-C
Interface — RS-232
Connectors — (2) DB25 female
Power — 115 VAC ± 10%, 60 Hz
Size — 1.8"H x 5.5"W x 8.6"D (4.6 x 14 x 21.8 cm)
Weight — 2 lb. (0.9 kg)

FAXBACK INFORMATION
Request Document Number: 10205
Call 412-746-5500 Anytime

ME251A-R2

SME-4
CTS TXD DSR
A A A
HI
CON
LB
DSR TXD CTS
B B B
BLACK BOX
(412) 746-5500

Item	Code	Price
SME-4M (for RS-232)		
38.4-Kbps Standalone	ME251A-R2	**$275.00**
Rackmount Card	ME251C-R2	**$255.00**
56-Kbps Standalone	ME253A	**$345.00**
Rackmount Card	ME253-C	**$295.00**
64-Kbps Standalone	ME255A	**$345.00**
Rackmount Card	ME255-C	**$310.00**
Rack up your SME-4M...		
12-Card Rack	RM008	**$305.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.

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Parallel and Serial Boosters

Put Your Printer Where You Need It.

- **Regenerate weak RS-232 or parallel transmissions.**
- **Move serial printers up to 100 feet away, parallel printers up to 40 feet.**

At the point where your transmission gets too weak to be recognized by the device on the other side of the line, install one of these Boosters. (Note that it should be installed in the middle of the line, not at the start.) The Booster will regenerate the signal at the correct RS-232 or parallel level.

ME001A is for serial transmission. ME002A is for parallel transmission via Centronics® connectors. ME003A is for parallel transmission via DB25 connectors.

SPECIFICATIONS

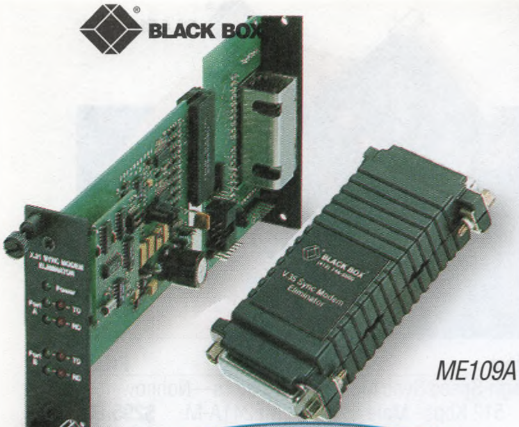
Operation — Transparent
Protocol — ME001A: Serial async or sync; ME002A: Parallel with Centronics connectors; ME003A: Parallel with DB25 connectors
Speed — Transparent
Interface — RS-232 or Centronics parallel
Connectors — ME001A, ME003A: (1) DB25 female, (1) DB25 male; ME002A: (2) Centronics female
Power — 115 VAC, 60 Hz, 12 watts via wallmount transformer
Size — 1.1"H x 3.5"W x 4.5"D (2.8 x 8.9 x 11.4 cm)

Item	Code	Price
Line Boosters		
232	ME001A	**$102.00**
Centronics	ME002A	**$102.00**
DB25 (Parallel)	ME003A	**$102.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.

Item	Code	Price
Centronics Compatible Cable, 10-ft. (3.0-m) Male/Male	EQN380-0010-MM	**$35.55**

For other lengths, see p. 105.



ME109A

MicroRACK Compatible

Synchronous Modem Eliminators

Compact and Rackmount Solutions for V.35 and X.21 Interfaces.

- **Speeds from 32 to 144 Kbps.**
- **For local data transfer—up to 300 feet (91.4 m).**

These compact SMEs are protocol-independent; all required data, clocking, and control signals pass between the two DTEs. And they can be configured to internal, external, or receive loopback clocking.

FAXBACK INFORMATION
Request Document Number: 14065
Call 412-746-5500 Anytime

SPECIFICATIONS

Clocking — Internal, external, or receive loopback
Distance — 300 ft. (91.4 m), DTE to DTE
Protocol — Synchronous
RTS/CTS Delay — Strap-selectable, 0, 7, 53 mS (± 15%)
Speed — 32 to 144 Kbps
CE Approval — All items listed are approved
Interface — ME109A, ME109C: V.35/RS-530; ME130C: X.21
Connectors — ME109A: (2) DB25 female pinned as RS-530; ME109C, ME130C: (2) Miniature UD-26
Indicators — ME109A, ME109C: (1) Power, (4) TD, (4) CD, (4) DTR; ME130C: 9 LEDs: (1) Power, (4) TD, (4) CD
Power — ME109A: From the interface; ME109C, ME130C: From the rack
Size — 3"H x 2"W x 0.8"D (7.6 x 5.1 x 2 cm)
Weight — 1 lb. (0.5 kg)

Item	Code	Price
Synchronous Modem Eliminators		
V.35 Standalone	ME109A	**$375.00**
V.35 Rackmount Card	ME109C	**$360.00**
X.21 Rackmount Card	ME130C	**$360.00**
MicroRACK System		**See pages 378–379.**

remember to order cables

For the V.35 Standalone:		
DB25M to M34M	EHN1206-05	**$69.95**
DB25M to M34F	EHN1206-06	**$69.95**
For the V.35 Rackmount Card:		
UD26M to M34M	EHN1206-01	**$89.95**
UD26M to M34F	EHN1206-02	**$89.95**
For the X.21 Rackmount Card:		
UD26M to M15M	EHN1206-03	**$49.65**
UD26M to M15F	EHN1206-04	**$49.95**

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Synchronous Modem Eliminator (SME) V.35

Choose High-Speed or Basic SME-V.35.

- **High-Speed model sends data at T1 and E1 speeds—2.048 Mbps—up to 4000 feet.**
- **Basic model reaches speeds of 56 or 64 Kbps—up to 2000 feet.**

High-Speed SME-V.35—Enables ultra-fast T1 and international E1 speeds. That means data cruises at up to 2.048 Mbps. And it breaks the normal V.35 distance limitations, too.

You can set up a high-speed local connection between sync devices, such as routers, up to 4000 feet (1219.2 m) apart.

Basic SME-V.35—Operates at 56 or 64 Kbps. It handles the proper pin crossing between your sync host and terminal, and also provides clocking.

SPECIFICATIONS

Operation — Half- or full-duplex
Protocol — Synchronous
Speed — ME107, ME108: Up to 2.048 Mbps (user-selectable); ME102-R2: 1.2, 2.4, 4.8, 9.6, 19.2, 48, 56, 64 Kbps
CE Approval — ME102-R2, ME107–108
Interface — ME108: V.35 pinned as RS-530; All others: V.35
Connectors — ME107: (2) 34-pin M-block female; ME108: (2) DB25 female; ME102-R2: (2) 34-pin M-block female
Power — ME107, ME108: 115-VAC, 60-Hz wallmount power supply; ME102-R2: 115 VAC ± 10%, 60 Hz
Size — 2.1"H x 8.8"W x 11.5"D (5.3 x 22.4 x 29.2 cm)
Weight — 2 lb. (0.9 kg)

ME108A

Item	Code	Price
High-Speed SME-V.35		
V.35-M34		
Standalone	ME107A	**$600.00**
Rackmount Card	ME107C	**$495.00**
V.35-DB25		
Standalone	ME108A	**$520.00**
Rackmount Card	ME108C	**$395.00**
Basic SME-V.35		
Standalone	ME102A-R2	**$510.00**
Rackmount Card	ME102C-R2	**$465.00**
Rack up your Basic or High-Speed SME-V.35 Cards...		
8-Card Rack (**p. 326**)	RM060	**$425.00**

remember to order cables

V.35 Interface Cable, 10-ft. (3.0-m) Male/Male EYN450-0010-MM **$83.95**

For other lengths or genders, see p. 89.

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Synchronous Modem Eliminator RS-530 (SME-530)

It Works with Your RS-530 Pinning Standards.

SME-530
CTS
TXD
PWR
DCD
RTS
RXD
BLACK BOX

- **Especially for RS-530 standards.**
- **Distances up to 4000 feet.**

Using RS-530 interfaces? Then this SME is for you. Just install the SME-530 between two devices up to 4000 feet (1219.2 m) apart. Use the selection switch to set speeds up to 448 Kbps.

Clocking is internal or external. You can also customize the interface leads, with straps inside the unit. Monitor your data at a glance with the front-panel LEDs, which indicate Transmit Data, Receive Data, Request To Send, Clear To Send, Power, and Data Carrier Detect or Receive Line Signal Detect.

SPECIFICATIONS

Operation — Half- or full-duplex
Protocol — Synchronous
Speed — Up to 448 Kbps, switch-selectable
CE Approval — All items listed are approved
Interface — RS-530
Connectors — (2) DB25 female
Power — 115 VAC, 60 Hz (230-VAC version on request)
Size — 1.6"H x 6.8"W x 10.5"D (4.1 x 17.3 x 26.7 cm)
Weight — 2 lb. (0.9 kg)

Item	Code	Price
Synchronous Modem Eliminator RS-530 (SME-530)		
Standalone	ME103A-R2	**$335.00**
Rackmount Card	ME103C-R2	**$310.00**
Rack up your SME-530...		
8-Card Rack (**p. 326**)	RM060	**$425.00**

remember to order cables

RS-530 Data Cable, 10-ft. (3.0-m) Male/Male EVN530-0010-MM **$41.95**

For other lengths or genders, see p. 88.

Synchronous Modem Eliminator RS-422 (SME-422)

Transmit Data as Fast as 448 Kbps on RS-422.

- **Speeds up to 448 Kbps.**
- **Distance up to 4000 feet (1219.2 m).**
- **Perfect for synchronous devices with RS-422 interfaces.**

Establish communication between your synchronous devices (terminals, CPUs, etc.) with RS-422 interfaces. The BLACK BOX® SME-422 sends data up to 4000 feet (1219.2 m) at speeds of up to 448 Kbps. Choose either internal or external clocking. Front-panel LEDs show you the status of your data.

SPECIFICATIONS

Operation — Half- or full-duplex
Protocol — Synchronous
CE Approval — ME101-C, RM011; ME101AE-R2 (the 230-VAC version)
Interface — RS-422
Connectors — (2) DB37 female
Power — 115 VAC ± 10%, 60 Hz
Size — 2.1"H x 8.8"W x 11.5"D (5.3 x 22.4 x 29.2 cm)
Weight — 2 lb. (0.9 kg)

Item	Code	Price
Synchronous Modem Eliminator RS-422 (SME-422)		
Standalone	ME101A-R2	**$405.00**
Rackmount Card	ME101-C	**$340.00**
Rack up your SME-422…		
6-Card Rack	RM011	**$295.00**
remember to order cables		
DB37 Interface Cable, 10-ft. (3.0-m) Male/Male	EDN37J-0010-MM	**$43.95**

For other lengths or genders, see p. 110.

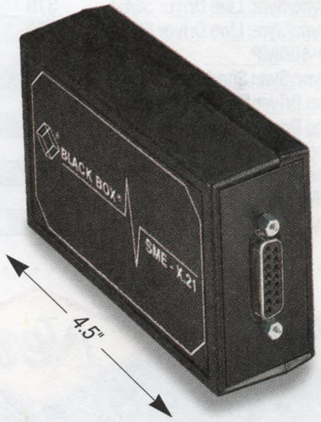
Synchronous Modem Eliminator X.21 (High-Speed SME-X.21)

The Ideal SME for X.21 Data Transfers—Powered or Non-Powered.

- **Speeds from 48 Kbps to 1.544 Mbps.**
- **Half- or full-duplex operation.**
- **Distance up to 2000 feet on each side, with use of optional power supply.**

This palm-sized SME works with or without power. Add the optional power supply, and you can send data up to 2000 feet (610 m) on each side of the SME. Without the power supply, you can still transmit data between two X.21 devices at distances up to 100 feet (30.5 m).

Our SME-X.21 is flexible, too. You select the data rates—from 48 Kbps to a blazing 1.544 Mbps. Use your SME-X.21 in different-speed applications, with different equipment—without modifying your existing system.



Send data up to 1.544 Mbps!

SPECIFICATIONS

Distance — Using line power: Up to 100 ft. (30.5 m) on each side;
Using Optional Power Supply: Up to 2000 ft. (610 m) on each side
Protocol — Synchronous
CE Approval — Available (ME121AE, the 230-VAC version)
Interface — X.21
Connectors — (2) DB15 female, (1) 2.1-mm barrel
Power — From the interface or from 115-VAC, 60-Hz Optional Power Supply
Size — 1.4"H x 2.7"W x 4.5"D (3.6 x 6.9 x 11.4 cm)
Weight — 0.2 lb. (0.1 kg)

Item	Code	Price
High-Speed SME-X.21	ME121A	**$335.00**
Optional Power Supply (115 VAC)	PS021	**$25.00**
remember to order cables		
X.21 Cable	EVNX21-001M-MM	**$26.40**

X.21 Sync Modem Eliminator

Get Direct DTE-to-DTE Connections for Your X.21 Applications.

- **Replaces two sync modems.**
- **Data rates of 56 or 64 Kbps.**
- **Get up to 330 feet (100.6 m) on each side.**
- **Generates signal timing for proper operation of sync DTEs.**
- **Half- or full-duplex operation.**

The BLACK BOX® X.21 Sync Modem Eliminator replaces two high-speed synchronous modems, enabling direct DTE-to-DTE connections. It operates at 56 or 64 Kbps, with a maximum range of 330 feet (100.6 m) on each side.

The X.21 SME generates the signal timing required for proper operation of the two sync DTEs, as well the control and indication signals necessary to emulate half- or full-duplex operation.

BLACK BOX
(412) 746-5500
X.21 ME
64 kbps

Replace two sync modems—
and have the speed to go the distance!

SPECIFICATIONS

Distance — Up to 330 ft. (100.6 m) on each side
Protocol — Synchronous
Speed — ME131A: Up to 56 Kbps;
ME132A: Up to 64 Kbps
CE Approval — All items listed are approved
Interface — X.21
Connectors — (2) DB15
Power — From the interface

Item		Code	Price
X.21 Sync Modem Eliminator			
56K	Female	ME131A-F	**$527.00**
	Male	ME131A-M	**$527.00**
64K	Female	ME132A-F	**$527.00**
	Male	ME132A-M	**$527.00**

No One Offers You More RS-232 Line Driver Choices than Black Box!

BUYER'S GUIDE

RS-232/COPPER LINE DRIVERS (AC-POWERED)

			Interface Type		Speed	Distance (Miles)		Line Connector			Line Type		Operation				Handshake Passing	Style	Surge Protection		
Item	**Page**	**Code**	**Async RS-232**	**Sync RS-232**	**Maximum Kbps**	**Minimum Speed**	**Maximum Speed**	**Screw Terminal**	**RJ-11 Female**	**RJ-45 Female**	**Point-to-Point**	**Multipoint**	**4-Wire Full-Duplex**	**4-Wire Half-Duplex**	**2-Wire Full-Duplex**	**2-Wire Half-Duplex**	**Number of Leads**	**Rack Card Available**	**Transformer Isolation**	**Optical Isolation**	**Diode**
Short-Haul Modem-FSK	364	ME840A	✓		9.6	9.5	9.5	✓			✓	✓	✓	✓	✓	✓	1				
Short-Haul Modem-B Async	366–367	ME800A	✓		19.2	4	1	✓			✓		✓				1	✓		✓	✓
SHM-B Sync	373	ME801A		✓	19.2	5	0.7	✓			✓		✓				1	✓		✓	✓
High-Speed SHM B Async	366	ME802A	✓		115.2	4	1.5	✓			✓		✓				1	✓		✓	✓
LD485A-MP	365	ME836A-R2	✓		64	4	0.7	✓			✓	✓	✓	✓		✓	1	✓			✓
SHM-B 2W	367	ME755A	✓		19.2	2.3	1.1	✓			✓				✓			✓			
LD485A-HS	365	ME837A	✓		115.2	0.8	0.4	✓			✓	✓	✓	✓		✓	1	✓			
LD485S-MP	373	ME742A-R2		✓	128	4	0.3	✓			✓	✓	✓	✓		✓	1	✓			
LD485A-HS Opto-Isolated	365	ME838A	✓		115.2	0.8	0.4	✓			✓	✓	✓	✓		✓	1	✓		✓	
Async/Sync Line Driver 56/64	376	ME350A-F	✓	✓	64	9.1	5.3		✓		✓		✓				1	✓	✓		✓
Async/Sync Line Driver 56/64	376	ME350A-M	✓	✓	64	9.1	5.3		✓		✓		✓				1	✓	✓		✓
Async/Sync Line Driver 56/64	376	ME351A-F	✓	✓	64	9.1	5.3			✓	✓		✓				1	✓	✓		✓
Async/Sync Line Driver 56/64	376	ME351A-M	✓	✓	64	9.1	5.3			✓	✓		✓				1	✓	✓		✓
LD-400MP	365	ME701A	✓		19.2	7	3	✓			✓	✓	✓	✓	✓	✓	1	✓			
Async/Sync Short-Haul Modem	375	ME475A	✓	✓	58	7.6	4	✓	✓		✓	✓	✓			✓	1		✓		✓
Line Driver Dual Handshake	371	ME680A-F	✓		57.6	2.4	1.1		✓		✓		✓	✓			2	✓	✓		✓
Line Driver Dual Handshake	371	ME680A-M	✓		57.6	2.4	1.1		✓		✓		✓	✓			2	✓	✓		✓
Line Driver Dual Handshake	371	ME681A-F	✓		57.6	2.4	1.1			✓	✓		✓	✓			2	✓	✓		✓
Line Driver Dual Handshake	371	ME681A-M	✓		57.6	2.4	1.1			✓	✓		✓	✓			2	✓	✓		✓
LDM-MR 19.2	375	ME760A	✓	✓	19.2	15	4	✓			✓	✓	✓	✓		✓	1				
Async/Sync 2-Wire Short-Haul	375	ME375A	✓	✓	128	3.4	3.4	✓			✓				✓		1				

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New
SHM-FSK
BLACK BOX®
(412) 746-5500
CD
RxD
TxD
LPBK
PWR
MASTER

ME840A

- **Frequency Shift Carrier operates above most industrial noise. Extreme tolerance to EMI/RFI interference!**
- **Totally transparent to data.**
- **Transmits full-duplex up to 20,000 feet at speeds up to 9600 bps.**
- **RS-485 Modules available.**
- **Point-to-point and multipoint operation.**

Short-Haul Modem-FSK (SHM-FSK)

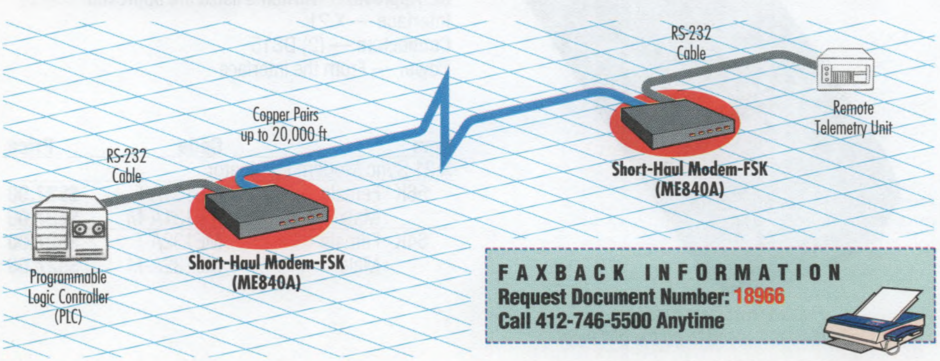
Extend Communications over a Single Pair—Even in the Noisiest Environments!

If your industrial work environment is noisy, you can squelch the interference with the new Short-Haul Modem-FSK (ME840A).

This SHM features Frequency Shift-Key operation, which provides high immunity to noise and interference—and is transparent to data and protocol. Adjust the SHM-FSK to changing line conditions. Modulate between 100 and 156.5 KHz to send signals above even the most harsh industrial noise. Make clean connections over a single-conductor pair.

SHM-FSK also transmits farther than most short-haul modems—up to 9.5 miles (15.3 km) half-duplex and 3.8 miles (6.1 km) full-duplex at 9600 bps.

Optional 2-Wire and 4-Wire Modules are available for RS-485.



FAXBACK INFORMATION
Request Document Number: 18966
Call 412-746-5500 Anytime

SPECIFICATIONS

Line Type — One twisted pair
Maximum Distance — Up to 3.8 miles (6.1 km) full-duplex over 22 AWG; 9.5 miles (15.3 km) half-duplex over 22 AWG
Maximum Speed — Up to 9600 bps
Protocol — Asynchronous
Interface — RS-232; optional RS-485 modules available
Connectors — DB25 female
Power — 115-VAC/24-VDC wall transformer supplied, 9 watts
Size — 1.3"H x 7.4"W x 11.3"D (3.3 x 18.8 x 28.7 cm)

Item		Code	Price
Short-Haul Modem-FSK		ME840A	**$775.00**
RS-485 Modules	2-Wire	MD3315	**$125.00**
	4-Wire	MD3316	**$125.00**

remember to order cables

Premium AT® Modem Cable
6-ft. (1.8-m)
EVMBMC-0006 **$17.95**

For other lengths, see page 109.

RS-232/RS-485 High-Speed Line Driver (LD485A-HS)

Speed, Surge Protection, and Optical Isolation, Too.

- **Speed—115 Kbps—and safety make it perfect for industrial applications.**
- **Customize it for your application.**

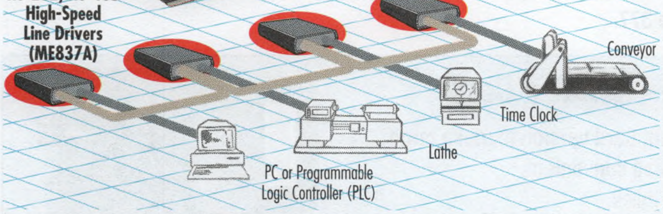
If you have high-speed equipment, you need this high-speed line driver.

It's versatile—perfect for 4-wire half- or full-duplex, 2-wire half-duplex, point-to-point, and multipoint applications.

And you can switch the RS-232 interface for DCE or DTE. If you use 2-wire half-duplex mode, you have an instantaneous line turnaround.

Improved surge-protection circuitry—transorbes, zener diodes, and inductors—protects against induced surges on the RS-485 side. Choose a model with optical isolation to protect your data from ground-loop surges and interference caused by industrial machines.

Optional Built-in
SURGE PROTECTION
LD485A-HS OPTO-ISOLATED
NORMAL
DLB
DCE
DTE
RX TX RTS CD
TX RX CD RTS
PWR
BLACK BOX
LD485A-HS


RS-232/RS-485 High-Speed Line Drivers (ME837A)
Conveyor
Time Clock
Lathe
PC or Programmable Logic Controller (PLC)

SPECIFICATIONS

Maximum Distance — 4000 ft. (1219.2 m)
Operation — 4-wire half- or full-duplex; 2-wire half-duplex, point-to-point, or multipoint
Protocol — Asynchronous
CE Approval — ME837A–ME838A, ME838C
Interface — Equipment: RS-232; Line: RS-485
Connectors — (1) DB25 female, (1) 4-screw terminal block
Power — 115 VAC, 60 Hz; 230-VAC versions on request
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)
Weight — 1.9 lb. (0.9 kg)

Item	Code	Price
RS-232/RS-485 High-Speed Line Driver (LD485A-HS)		
Standalone	ME837A	**$225.00**
Rackmount Card	ME837C	**$195.00**
RS-232/RS-485 High-Speed Opto-Isolated Line Driver (LD485A-HS Opto-Isolated)		
Standalone	ME838A	**$250.00**
Rackmount Card	ME838C	**$225.00**

If your serial port can't handle these speeds, order our:
RS-232↔RS-485/449 Interface Converter
See page 324.

Rack up your Line Driver Cards...

Item	Code	Price
Multi-Function Rack (16-Card)	RM005	**$435.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.

RS-232/RS-485 Multipoint Line Driver (LD485A-MP)

Get up to 64 Drops on Your RS-232 Multipoint Applications.

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!

- Daisychain and run up to 64 devices with a single controller.
- Drivers are enabled by data—no RTS control necessary.
- Point-to-point or multipoint applications.
- 4-wire full-duplex or 2-wire half-duplex.
- Ready Pak includes AT Modem Cable.

FAXBACK INFORMATION
Request Document Number: 11220
Call 412-746-5500 Anytime

SPECIFICATIONS

Maximum Distance — 4 mi. (6.4 km)
Operation — 4-wire full-duplex, 2-wire half-duplex, point-to-point or multipoint
Protocol — Asynchronous
Speed — Up to 64 Kbps
CE Approval — RM005 and 230-VAC version: ME836AE-R2
Interface — RS-232; RS-485
Connectors — (1) DB25 female, (1) 4-screw terminal block
Power — 115 VAC, 60 Hz; 230-VAC; 50-Hz version on request
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)

LD485A-MP
NORMAL
DLB
BLACK BOX
PWR

Item	Code	Price
RS-232/RS-485 Multipoint Line Driver (LD485A-MP)		
Standalone	ME836A-R2	**$185.00**
LD485A-MP Ready Pak Includes the Line Driver **plus** (**1**) 6-ft. AT Modem Cable	ME836A-R2-CABPAK	**$202.95**
Rackmount Card	ME836C-R2	**$155.00**
Multi-Function Rack (16-Card)	RM005	**$435.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.

Multipoint Line Driver (LD-400MP)

Up to 15 Drops for Your Multipoint Applications.

- Asynchronous data runs at up to 19.2 Kbps.
- Distances up to 7 miles!
- Point-to-point and multipoint applications.
- Operates in 2- or 4-wire half- or full-duplex modes.
- Sends asynchronous RS-232 data to up to 15 locations over only one data-transmission link.

BLACK BOX
DLB
LD-400MP

SPECIFICATIONS

Diagnostics — Digital loopback
Maximum Distance — 7 mi. (11.3 km)
Operation — 2- or 4-wire, half- or full-duplex, point-to-point or multipoint
Protocol — Asynchronous
CE Approval — 230-VAC version: ME701AE
Interface — RS-232
Connectors — (1) DB25 female, (1) 4-screw terminal block
Power — External, 115 VAC, 60 Hz
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)

FAXBACK INFORMATION
Request Document Number: 11220
Call 412-746-5500 Anytime

Item	Code	Price
Multipoint Line Driver LD-400MP		
Standalone	ME701A	**$310.00**
Rackmount Card	ME703-C	**$260.00**
Rack Nest 400	RM700A	**$700.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.

MicroRACK
High-Speed Copper
Fiber

Async, Point-to-Point,

For Extending RS-232 Distances, Nothing Installs

BLACK BOX®
TD
RD
NORMAL
LOOPBACK
ASYNC. SHORT HAUL MODEM

The compact SHM-B is only 1.5"H x 4.3"W x 4.5"D.

SPECIFICATIONS

Maximum Distance — ME800A, ME805-C: 4 mi. (6.4 km); ME755A, ME755-C: 2 mi. (3.2 km)
Operation — ME800A, ME805-C: 4-wire, full-duplex; ME755A, ME755-C: 2-wire, full-duplex
Speed — Up to 19.2 Kbps
CE Approval — ME805-C
Interface — RS-232
Connectors — (1) DB25 female, (1) 4-screw terminal block
Power — 115 VAC, 60 Hz ±10% (wallmount), 5 watts
Size — ME800A, ME755A: 1.5"H x 4.3"W x 4.5"D (3.8 x 10.9 x 11.4 cm); ME805-C, ME755-C: 0.5"H x 4.3"W x 4.5"D (1.3 x 10.9 x 11.4 cm)

Short-Haul Modem-B Async (SHM-B Async)/Short-Haul Modem 2-Wire

- **Async transmission up to 4 miles (6.4 km) on four wires.**
- **Ready Paks come with (1) 6-ft. AT Modem Cable (EVMBMC-0006).**

Are your users too far away from the host in your RS-232 async environment? Then you need the Short-Haul Modem-B Async (SHM-B). At speeds of up to 19.2 Kbps, it transmits async data up to 4 miles.

RS-232 is the most common interface in use today. This means you can use your SHM-B in thousands of RS-232 installations—industrial applications, security systems, UNIX®, DEC™, and HP® workstation connectivity, and more.

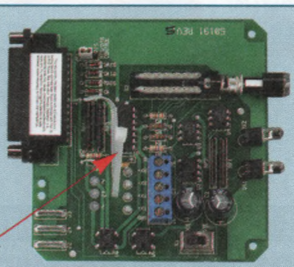
The SHM-B comes with a flip-top lid for quick DTE/DCE selection. Run loopback tests simply by pressing a front-panel button. Transformer and optical isolation protect your data from electrical interference.

The SHM-B is compatible with SHM-NPR (ME721A) on **page 368**, and the SHM-B Parallel (ME806A or ME807A) on **page 377**.

The SHM-B Async—What a Card!

Also available in a Rackmount Card version to make large installations more compact and convenient.

- Async transmission up to 4 miles.
- Optical isolation protects against ground loops.
- Surge protection protects against power spikes from nearby lightning or other power problems.
- LEDs monitor RS-232 Transmit and Receive.



Built-in strain-relief for securing cables.

ME805-C

The Cost-Effective Ethernet Alternative

For data entry or process control, a SHM is an inexpensive alternative to Ethernet.

Here's why:

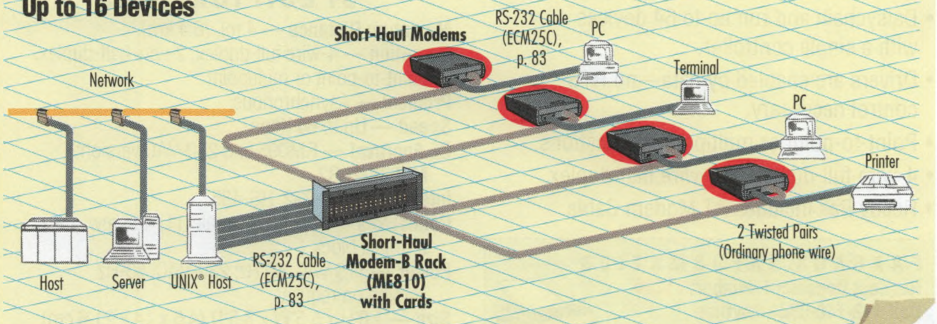
Savings. A major expense of Ethernet is running new cable. A SHM operates over the phone wiring you already have, as well as on higher-grade twisted pair.

Greater Stability. A SHM is less sensitive to electrical interference than Ethernet is.

Greater Distance. 10BASE-T takes you only 328 feet. A SHM takes you up to four miles.

If you're looking at savings over the long haul, you can't beat our Short-Haul Modems!

Up to 16 Devices


Short-Haul Modems
RS-232 Cable (ECM25C), p. 83
PC
Terminal
PC
Printer
Network
2 Twisted Pairs (Ordinary phone wire)
Host
Server
UNIX® Host
RS-232 Cable (ECM25C), p. 83
Short-Haul Modem-B Rack (ME810) with Cards

High-Speed Short-Haul Modem-B Async (SHM-B Async)

For High-Speed RS-232 Extension—up to 115.2 Kbps!

BLACK BOX®
TD
RD
NORMAL
DLB
HIGH SPEED SHM-B ASYNC

The High-Speed SHM-B Async from Black Box transmits your async data up to 4 miles at speeds up to 115.2 Kbps.

Use it for applications that require a higher speed than the SHM-B Async (**above**).

The High-Speed SHM-B Async is housed in a sturdy metal case. Run loopback tests simply by pressing a front-panel button. And you get the same great transformer and optical isolation as the SHM-B.

SPECIFICATIONS

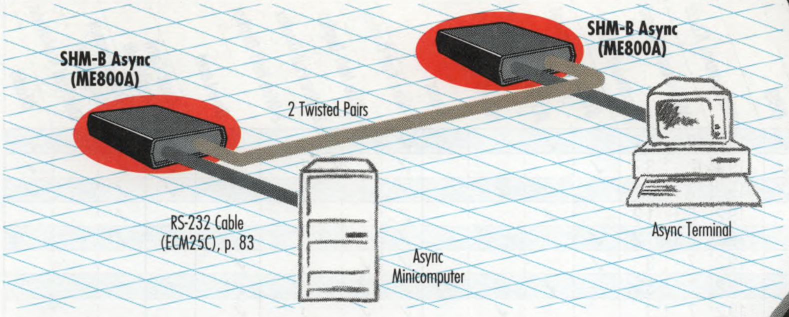
Diagnostics — Local loopback
Maximum Distance — 4 mi. (6.4 km)
Operation — 4-wire, full-duplex, point-to-point
Speed — Up to 115.2 Kbps
CE Approval — ME802A
Interface — RS-232
Connectors — (1) DB25 female, (1) 4-screw terminal block
Power — 115 VAC, 60 Hz ±10% (wallmount), 5 watts
Size — 1.5"H x 4.3"W x 4.5"D (3.8 x 10.9 x 11.4 cm)

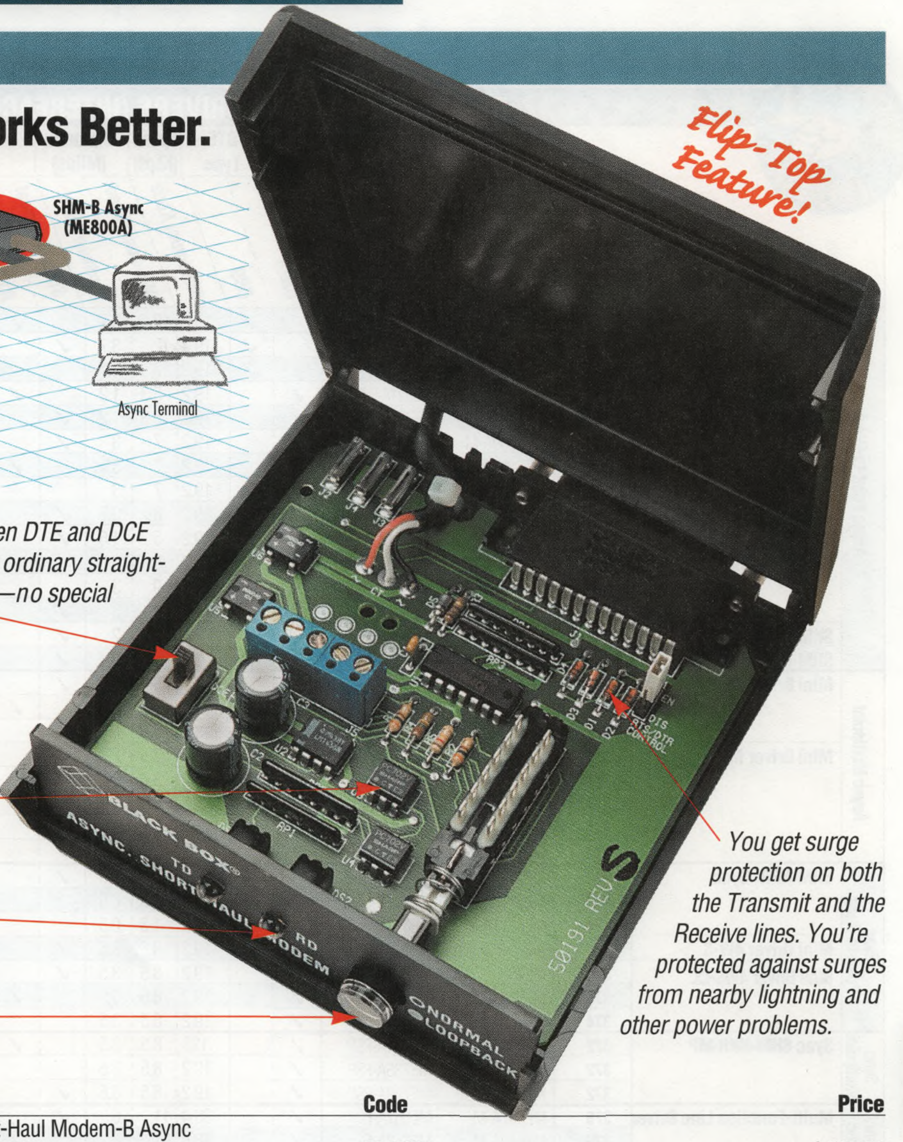
Item	Code	Price
High-Speed Short-Haul Modem-B Async		
Metal Enclosure/No Flip-Top	ME802A	**$185.00**
Rackmount Card	ME802C	**$170.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010-MF	**$23.95**

For other lengths, see p. 83.

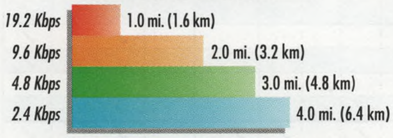
AC-Powered

Faster, Sets Up Easier, or Works Better.





Speed/Distance Chart*



***Based on 24 AWG unshielded twisted pair. Actual distances may vary.**

Switch between DTE and DCE easily. Use an ordinary straight-pinned cable—no special pinning.

Optical isolation eliminates ground-loop problems.

Monitor RS-232 Receive and Transmit. Green indicates low RS-232 level. Red indicates high level.

Check SHM-B operation at both ends with a loopback test. Just push this button.

You get surge protection on both the Transmit and the Receive lines. You're protected against surges from nearby lightning and other power problems.

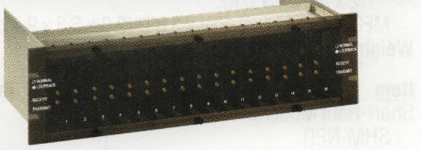
CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!

Item	Code	Price
Short-Haul Modem-B Async		
Standalone	ME800A	$145.00
Ready Pak Includes Standalone SHM-B Async **plus** (**1**) 6-ft. AT Modem Cable	ME800A-CABPAK	$162.95
Rackmount Card	ME805-C	$135.00
Ready Pak Includes SHM-B Async Card **plus** (**1**) 6-ft. AT Modem Cable	ME805-C-CABPAK	$158.95
Short-Haul Modem 2-Wire		
Standalone	ME755A	$220.00
Rackmount Card	ME755-C	$205.00
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010-MF	$23.95

For other lengths, see p. 83.

FAXBACK INFORMATION
For SHM-B Async (ME800A): 11220
For High-Speed SHM-B (ME802A): 13143
Call 412-746-5500 Anytime

Short-Haul Modem-B Rack (16–Card)



Consolidate Your Short-Haul Modem Cards into a 19" Rack.

- Group up to 16 Short-Haul Modem Cards in one neat Rack—all your controls are at your fingertips.
- Mounts easily in any 19" cabinet.
- Uses less space than standalone models.
- All cabling is routed into rear of rack.
- 5.5"H x 19"W x 8.8"D (14 x 48.3 x 22.4 cm)

Item	Code	Price
Short-Haul Modem-B Rack (16-Card)	ME810	$360.00

Short-Haul Modem-B Desktop Rack (8–Card)

Set This Convenient Rack Anywhere.

- Group up to 8 Short-Haul Modem Cards in one desktop Rack.
- Set the Rack on any flat surface.
- Cut down on cabling and organize all your controls in one central site.
- Uses less space than standalone models.
- All cabling is routed into rear of rack.
- 6.3"H x 10"W x 8"D (16 x 25.4 x 20.3 cm)

Item	Code	Price
Short-Haul Modem-B Desktop Rack (8-Card)	RM007	$330.00

MicroRACK
High-Speed Copper
Fiber

Async,

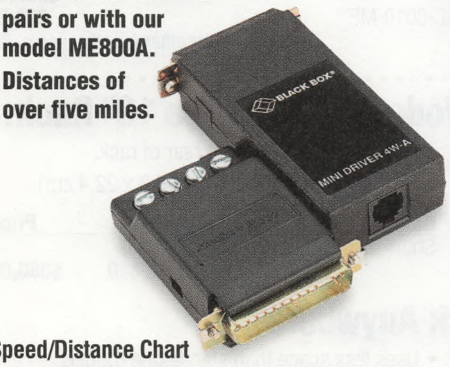
RS-232/COPPER LINE DRIVERS (INTERFACE-POWERED)

	Item	Page	DTE Connector Gender and Code		DTE Type		Speed (Kbps)	Distance (Miles)		Line Connector				Operation				Handshake Passing	Style	Surge Protection		
			Male	Female	DB25	DB9	Maximum Kbps	Minimum Speed	Maximum Speed	Screw Terminal	RJ-11 Female	RJ-45 Female	Coax	4-Wire Full-Duplex	4-Wire Half-Duplex	2-Wire Full-Duplex	2-Wire Half-Duplex	One Lead	Rack Card Available	Transformer Isolation	Optical Isolation	Diode
Async Point-to-Point	Microdriver 9	370	ME792A-MSP	ME792A-FSP		✓	19.2	12	3.7		✓			✓					✓	✓		✓
		370	ME793A-MSP	ME793A-FSP		✓	19.2	12	3.7	✓				✓					✓	✓		✓
		370	ME794A-MSP	ME794A-FSP		✓	19.2	12	3.7			✓		✓					✓	✓		✓
	SHM-NPR/RJ	368	ME821A-M-R2	ME821A-F-R2	✓		19.2	5.3	1.2		✓			✓						✓		
	SHM-NPR, Async	368	ME721A-M	ME721A-F	✓		19.2	5.3	1.2	✓				✓						✓		
		369	ME6100A-M	ME6100A-F			19.2	7	3	✓				✓	✓			✓				
		369	ME6101A-M	ME6101A-F	✓		19.2	7	3		✓			✓	✓			✓				
		369	ME6102A-M	ME6102A-F			19.2	7	3			✓		✓	✓			✓				
	CS Mini Driver-A	370	ME731A-MSP	ME731A-FSP	✓		19.2	8	3.7	✓				✓					✓	✓		✓
	Mini Driver 4W-AI	369	ME762A-M	ME762A-F	✓		19.2	5	1.6	✓				✓						✓		
	HS Mini Driver	370	ME862A-MSP-R2	ME862A-FSP-R2	✓		115.2	9	3		✓			✓						✓		✓
		370	ME863A-MSP-R2	ME863A-FSP-R2	✓		115.2	9	3			✓		✓						✓		✓
		370	ME864A-MSP-R2	ME864A-FSP-R2	✓		115.2	9	3	✓				✓						✓		✓
	SHM-NPR 2-Wire	369	ME738A-M	ME738A-F	✓		9.6	3	2	✓						✓						
	SHM-NPR Plus	369	ME739A-M	ME739A-F	✓		9.6	0.4	0.4	✓						✓				✓		
Async Multipoint	Mini Driver MP9	371	ME775A-MSP	ME775A-FSP		✓	115.2	5.6	3	✓				✓	✓		✓	✓		✓		✓
		371	ME776A-MSP	ME776A-FSP		✓	115.2	5.6	3		✓			✓	✓		✓	✓		✓		✓
		371	ME777A-MSP	ME777A-FSP		✓	115.2	5.6	3			✓		✓	✓		✓	✓		✓		✓
	Mini Driver MP	371	ME745A-M	ME745A-F	✓		38.4	2.5	2.5	✓				✓	✓		✓	✓	✓			
		371	ME771A-MSP-R2	ME771A-MSP-R2	✓		115.2	5.6	3	✓				✓	✓		✓	✓	✓	✓		✓
		371	ME772A-MSP-R2	ME772A-MSP-R2	✓		115.2	5.6	3		✓			✓	✓		✓	✓	✓	✓		✓
		371	ME773A-MSP-R2	ME773A-MSP-R2	✓		115.2	5.6	3			✓		✓	✓		✓	✓	✓	✓		✓
		372	ME764A-MSP	ME764A-FSP	✓		19.2	8	3.7	✓				✓	✓			✓		✓		
Sync Point-to-Point	SHM-NPR, Sync	374	ME749A-M	ME749A-F	✓		19.2	5	2.5	✓									✓	✓		
		374	ME6110A-M	ME6110A-F	✓		19.2	1.3	0.5				✓			✓				✓		
		374	ME6111A-M	ME6111A-F	✓		19.2	1.3	0.5				✓			✓				✓		
	Mini Driver 4W-S	374	ME750A-MSP	ME750A-FSP	✓		19.2	8.5	3.5	✓				✓					✓	✓		✓
	Mini Driver 4WS-CL	374	ME753A-MSP	ME753A-FSP	✓		19.2	8.5	3.5	✓				✓					✓	✓		✓
		374	ME754A-MSP	ME754A-FSP	✓		19.2	8.5	3.5		✓			✓					✓	✓		✓
		374	ME756A-MSP	ME756A-FSP	✓		19.2	8.5	3.5			✓		✓					✓	✓		✓
Sync Multipoint	Sync SHM-NPR MP	372	ME734A-MSP	ME734A-FSP	✓		128	8.5	3.5		✓			✓	✓			✓	✓	✓		✓
		372	ME735A-MSP	ME735A-FSP	✓		19.2	8.5	3.5			✓		✓	✓			✓	✓	✓		✓
		372	ME729A-MSP	ME729A-FSP	✓		19.2	8.5	3.5	✓				✓	✓			✓	✓	✓		✓
Async/Sync	Multi-Function Line Driver	376	ME657A-M	ME657A-F	✓		38.4	11	6	✓				✓					✓	✓		✓
		376	ME658A-M	ME658A-F	✓		38.4	11	6		✓			✓					✓	✓		✓
		376	ME659A-M	ME659A-F	✓		38.4	11	6			✓		✓					✓	✓		✓

Short-Haul Modem—Nonpowered, Async (SHM-NPR)

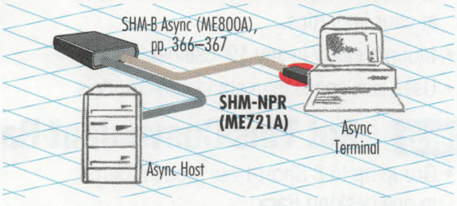
Simple and Reliable—4-Wire, Async Plug-In SHM Goes up to 3.2 Miles at 9600 bps.

- **Flexible. Use them in pairs or with our model ME800A.**
- **Distances of over five miles.**

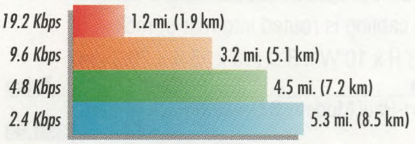


Forget about the 50-foot (15.2-m) limit of your RS-232 cable. This simple, plug-in modem pushes the data up to 1.2 miles (1.9 km) at 19.2 Kbps—or over 5 miles (8 km) at 2.4 Kbps.

To connect your asynchronous devices to your host, use a pair of our SHM-NPRs—or a SHM-NPR and an ME800A. See **pages 366–367**.



Speed/Distance Chart



FAXBACK INFORMATION
Request Document Number: 10157
Call 412-746-5500 Anytime

SPECIFICATIONS

Maximum Distance — 5.3 mi. (8.5 km)
Operation — 4-wire full-duplex
Protocol — Asynchronous
CE Approval — ME721A
Connectors — ME721A: (1) DB25, (1) 4-screw terminal; ME821A: (1) DB25, (1) RJ-11
Power — Set as DCE: Pins 2, 4, 20 minimum; Set as DTE: Pins 3, 5, 6 minimum; 12 volts nominal, 9 volts minimum
Size — ME721A: 0.8"H x 2.2"W x 2.8"D (2 x 5.6 x 7.1 cm); ME821A: 0.9"H x 2.1"W x 3.8"D (2.3 x 5.3 x 9.7 cm)
Weight — 0.6 lb. (0.3 kg)

Item	Code	Price
Short-Haul Modem—Nonpowered, Async		
SHM-NPR		
Male	ME721A-M	**$80.00**
Female	ME721A-F	**$80.00**
SHM-NPR/RJ		
Male	ME821A-M-R2	**$77.00**
Female	ME821A-F-R2	**$77.00**

remember to order cables

Category 3 Solid Bulk PVC Cable, 2-pair, 1000-ft. (304-m)
EYN712A-1000 **$57.95**
For other lengths, see p. 116.

Interface-Powered

Async SHM-NPR

Get Speed and Transformer Isolation for Async Transmissions up to 4.5 Miles.

NOTE: Must be used in pairs.

Async SHM-NPR

- **Insensitive to wire polarity.**
- **Operates full- or half-duplex.**

Connect full- or half-duplex asynchronous terminals with the Async SHM-NPR. It can operate up to 19.2 Kbps at a distance of up to 4.5 miles (7.2 km).

The Async SHM-NPR is insensitive to wire polarity, so it's easy to install and maintain. And its connection to the line is through isolation transformers for protection against overvoltages.

The Async SHM-NPR has three line connector options—terminal block, RJ-11, or RJ-45.

SPECIFICATIONS

Maximum Distance — 4.5 mi. (7.2 km)
Operation — 4-wire full- or half-duplex
Protocol — Asynchronous
Speed — Up to 19.2 Kbps

Item	Code	Price
Async SHM-NPR		
Terminal Block		
Female	ME6100A-F	**$129.00**
Male	ME6100A-M	**$129.00**
RJ-11 Female	ME6101A-F	**$129.00**
Male	ME6101A-M	**$129.00**
RJ-45 Female	ME6102A-F	**$129.00**
Male	ME6102A-M	**$129.00**

◆ ◆ ◆

Mini Driver 4-Wire Isolated (Mini Driver 4W-Ai)

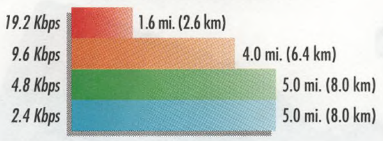
Transformer Isolation for 4-Wire, Full-Duplex Transmissions.

- **Distances up to 5 miles.**
- **Speeds up to 19.2 Kbps.**
- **4-wire full-duplex.**

Exchange data across a building or a campus. This nonpowered Mini Driver is transformer-isolated to protect your data from harmful transients. Just plug it right into the RS-232 connector of your computer or terminal. No additional power supply is necessary.

This Mini Driver sends your asynchronous data at speeds up to 19.2 Kbps and at distances of up to 5 miles (8 km). (See the chart to the **right.**)

Speed/Distance Chart



SPECIFICATIONS

Maximum Distance — 5 mi. (8 km)
Operation — 4-wire full-duplex
Protocol — Asynchronous
CE Approval — All items listed are approved
Connectors — (1) DB25, (1) 5-screw terminal
Power — Pins 2, 4, 20; 6 VDC
Size — 4.3"H x 2.1"W x 0.9"D (10.9 x 5.3 x 2.3 cm)
Weight — 0.6 lb. (0.3 kg)

NOTE: Must be used in pairs.

Item	Code	Price
Mini Driver 4-Wire Isolated (Mini Driver 4W-Ai)		
Male	ME762A-M	**$98.00**
Female	ME762A-F	**$98.00**

◆ ◆ ◆

Short-Haul Modem—2-Wire (SHM NPR 2-Wire)

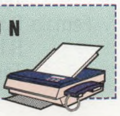
Use 2-Wire Cable to Transmit Data Full-Duplex.

- **Use this model if you have only two wires installed.**
- **SHM-NPR Plus has transformer isolation for use between buildings.**

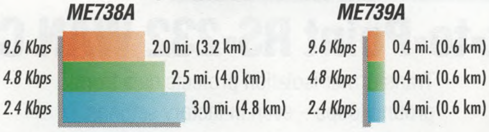
Specially designed to work in full-duplex mode over only two wires—use your existing two-wire telephone line or coax cables.

Use the SHM-NPR Plus with built-in transformer isolation for between-building applications up to 0.4 miles (0.6 km) away. Use the base model for in-building applications only.

FAXBACK INFORMATION
Request Document Number: 11220
Call 412-746-5500 Anytime



Speed/Distance Charts



SPECIFICATIONS

Maximum Distance — ME738A: 3 mi. (4.8 km); ME739A: 0.4 mi. (0.6 km)
Maximum Speed — ME738A: 9600 bps; ME739A: 19.2 Kbps
Operation — 2-wire full-duplex
Protocol — Asynchronous
CE Approval — All items listed are approved
Connectors — (1) DB25, (1) 2-screw terminal
Power — From the interface
Size — 4.3"H x 2.1"W x 0.9"D (10.9 x 5.3 x 2.3 cm)
Weight — 0.6 lb. (0.3 kg)

SHM NPR 2-WIRE
ME738A

NOTE: Must be used in pairs.

Item	Code	Price
Short-Haul Modems (2-Wire)		
SHM-NPR		
Male	ME738A-M	**$170.00**
Female	ME738A-F	**$170.00**
SHM-NPR Plus		
Male	ME739A-M-R2	**$165.00**
Female	ME739A-F-R2	**$165.00**

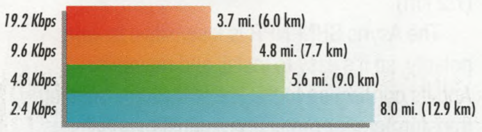
Carrier Sense Mini Driver-A (CS Mini Driver-A)

Carrier-Sense for UNIX Systems.

BLACK BOX®
CS MINI DRIVER-A
S/N
DCE DTE

- Carrier-sense detects remote power condition.
- Distances up to 8 miles (12.9 km).
- Built-in surge protection available.

Speed/Distance Chart



NOTE: Must be used in pairs.

SPECIFICATIONS

Operation — 4-wire full-duplex
CE Approval — All items listed are approved
Connectors — (1) DB25 male or female and either (1) 5-screw terminal block, (1) RJ-45, or (1) RJ-11
Power — DTE Mode: Pins 3, 5, 6, 8, 9; DCE Mode: Pins 2, 4, 9, 20
Size — 2.7"H x 2.1"W x 0.7"D (6.9 x 5.3 x 1.8 cm)
Weight — < 0.1 lb. (<0.05 kg)

Optional Built-in SURGE PROTECTION

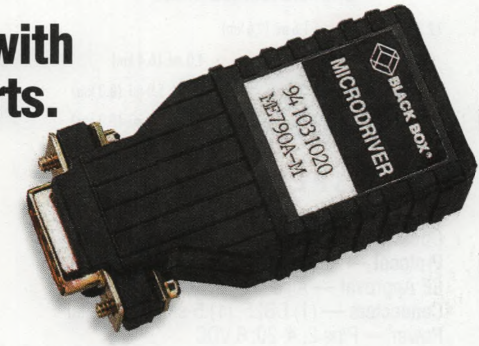
Item	Code	Price
Carrier Sense Mini Driver-A/5-Screw Terminal Block		
Male	ME731A-M	**$85.00**
Female	ME731A-F	**$85.00**
with Surge Protection		
Male	ME731A-MSP	**$90.00**
Female	ME731A-FSP	**$90.00**
Carrier Sense Mini Driver-A/RJ-11		
Male	ME732A-M	**$85.00**
Female	ME732A-F	**$85.00**
with Surge Protection		
Male	ME732A-MSP	**$90.00**
Female	ME732A-FSP	**$90.00**
Carrier Sense Mini Driver-A/RJ-45		
Male	ME733A-M	**$85.00**
Female	ME733A-F	**$85.00**
with Surge Protection		
Male	ME733A-MSP	**$90.00**
Female	ME733A-FSP	**$90.00**

* * *

Microdriver 9

Perfect for Computers with Closely Spaced DB9 Ports.

- Async, 4-wire on DB9 connectors.
- Fits PC/AT®, Unisys® 6000 or 7000 series, and NCR Tower® computers.
- Have room left over for other connections!
- Built-in surge protection available.



SPECIFICATIONS

Distance — 12 mi. (19.3 km) at 1200 bps (24 AWG wire); 3.7 mi. (6 km) at 19.2 Kbps
Operation — 4-wire half- or full-duplex
Protocol — Asynchronous
CE Approval — All items listed are approved
Connectors — (1) DB9 male or female and either (1) 5-screw terminal block, (1) RJ-45, or (1) RJ-11
Power — DTE mode: Pins 3, 5, 6, 8, 9; DCE mode: Pins 2, 4, 9, 20
Size — 2.7"H x 2.1"W x 0.7"D (6.9 x 5.3 x 1.8 cm)

NOTE: Must be used in pairs.

Optional Built-in SURGE PROTECTION

Item	Code	Price
Microdriver 9 RJ-11		
Male	ME790A-M	**$72.00**
Female	ME790A-F	**$72.00**
with Surge Protection		
Male	ME792A-MSP	**$77.00**
Female	ME792A-FSP	**$77.00**
Microdriver 9 5-Screw Terminal Block		
Male	ME791A-M	**$72.00**
Female	ME791A-F	**$72.00**
with Surge Protection		
Male	ME793A-MSP	**$77.00**
Female	ME793A-FSP	**$77.00**
Microdriver 9 RJ-45		
Male	ME794A-M	**$72.00**
Female	ME794A-F	**$72.00**
with Surge Protection		
Male	ME794A-MSP	**$77.00**
Female	ME794A-FSP	**$77.00**

* * *

HS Mini Driver with Transformer Isolation and Surge Protection

Up to 9 Miles of Point-to-Point RS-232 WAN Connections.

DCE DTE
BLACK BOX®
(412) 746-5500
Code: ME862A-MSP
Item: HS Mini Driver with XFMR Isolation
S/N:

NOTE: Must be used in pairs.

- Transformer isolation protects data from ground loops—even in factory settings.
- All control signals loop back at the RS-232 interface, so only data passes through.

SPECIFICATIONS

Maximum Distance — 9 mi. (14.5 km) at 1200 bps
Operation — Full-duplex
Protocol — Asynchronous
Speed — Up to 115.2 Kbps
CE Approval — All items listed are approved
Connectors — RS-232: (1) DB25 male or female; Line: (1) RJ-11, (1) RJ-45, or (1) terminal block with strain relief
Power — From the RS-232 interface
Size — 2.7"H x 2.1"W x 0.7"D (6.9 x 5.3 x 1.8 cm)

FAXBACK INFORMATION
Request Document Number: 15767
Call 412-746-5500 Anytime

Item	Code	Price
High-Speed Mini Driver with Transformer Isolation and Surge Protection		
Male RJ-11	ME862A-MSP-R2	**$104.00**
RJ-45	ME863A-MSP-R2	**$104.00**
Terminal Block	ME864A-MSP-R2	**$104.00**
Female RJ-11	ME862A-FSP-R2	**$104.00**
RJ-45	ME863A-FSP-R2	**$104.00**
Terminal Block	ME864A-FSP-R2	**$104.00**

Interface-Powered

MicroRACK Compatible

Optional Built-in SURGE PROTECTION

Line Driver-Dual Handshake

Twice the Flow-Control Capabilities for Campus Internet Links.

- **Ideal for SLIP/PPP connections! Passes two out-of-band RTS/CTS/DTR/DCD control signals.**
- **Transmit async RS-232 data at up to 57.6 Kbps, up to 2.4 miles (3.9 km) away.**
- **Built-in transformer isolation and surge protection keep data and equipment safe.**

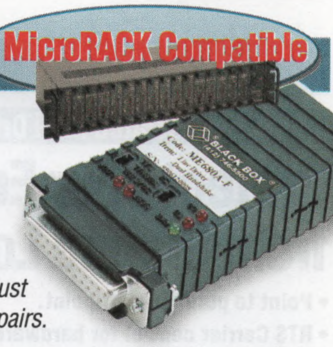
Create an Internet server—with a pair of Line Driver-Dual Handshakes and twisted-pair wire! It includes a built-in V.52 BER test generator and tri-state LED indicators. The Dual Handshake also performs V.54 loopback tests. Communication is protected from ground loops by 1500 V RMS isolation transformers.

Configure the Line Driver-Dual Handshake to an extremely wide range of applications. Customize data rates, clocking methods, V.54 test modes, and extended signaling rates. Plug the Driver directly into twisted-pair RJ-11 or RJ-45 jacks and the DB25 port of an RS-232 device.

FAXBACK INFORMATION
Request Document Number: 14089
Call 412-746-5500 Anytime

SPECIFICATIONS

Diagnostics — V.54 test modes (switch-selectable; BERT V.52)
Maximum Distance — 2.4 miles (3.9 km) over 24 AWG twisted pair, independent of speed
Protocol — Asynchronous
Speed — 1200 bps to 57.6 Kbps
CE Approval — ME680A, ME680C–ME681C, RM216 and 230-VAC versions: ME680AE–ME681AE
Connectors — (1) DB25 male or female; (1) RJ-11 or RJ-45
Power — 115 VAC, 60 Hz or 230 VAC, 50 Hz, external wallmount transformer
Size — 3.6"H x 2.1"W x 0.8"D (9.1 x 5.3 x 2 cm)



NOTE: Must be used in pairs.

Item			Code	Price
Line Driver-Dual Handshake				
Standalone				
	DB25/RJ-11	Male	ME680A-M	**$325.00**
		Female	ME680A-F	**$325.00**
	DB25/RJ-45	Male	ME681A-M	**$325.00**
		Female	ME681A-F	**$325.00**
Rackmount Cards				
	DB25/RJ-11	Female	ME680C	**$310.00**
	DB25/RJ-45	Female	ME681C	**$310.00**
To mount the Rackmount Card versions, you may need...				
MicroRACK				
	2-Card		RM202	**$110.00**
	4-Card		RM204	**$165.00**
	8-Card		RM208	**$240.00**
	16-Card		RM216	**$325.00**

For more on the MicroRACK, see pp. 378–379.

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Multipoint Mini Driver (Mini Driver MP)

Speed! Distance! 50 Drops!

- ME745A-R2 runs up to 38.4 Kbps as far as 2.5 miles (4.0 km) away. ME771A–ME773A run up to 115.2 Kbps as far as 3 miles (4.8 km).
- Point to point or multipoint.
- Operates on 2- or 4-wire twisted pair, half- or full-duplex.
- Carrier-control mode for hardware-controlled devices.
- Built-in surge protection.

BLACK BOX
MINI DRIVER V
ME745A/F
BLACK BOX
Mini Driver MP

SPECIFICATIONS

CE Approval — All items listed are approved
Connectors — All: (1) DB25 male or female;
ME745A-R2: (1) 5-screw terminal;
ME771A–ME773A: either (1) 5-screw terminal block, (1) RJ-11, or (1) RJ-45
Power — 6 VDC from the RS-232 interface;
ME745A-R2: Pins 2, 4, 20;
ME771A–ME773A: DTE Mode: Pins 3, 5, 6, 8, 9; DCE Mode: Pins 2, 4, 9, 20
Size — ME745A-R2: 4.3"H x 2.1"W x 0.9"D (10.9 x 5.3 x 2.3 cm);
ME771A–ME773A: 2.7"H x 2.1"W x 0.7"D (6.9 x 5.3 x 1.8 cm)

Optional Built-in SURGE PROTECTION

NOTE: Order one unit for each attached device.

Item			Code	Price
Mini Driver MP/5-Screw Terminal Block				
	Male		ME745A-M-R2	**$100.00**
	Female		ME745A-F-R2	**$100.00**
	with Surge Protection			
		Male	ME771A-MSP-R2	**$125.00**
		Female	ME771A-FSP-R2	**$125.00**
Mini Driver MP/RJ-11 with Surge Protection				
	Male		ME772A-MSP-R2	**$118.00**
	Female		ME772A-FSP-R2	**$118.00**
Mini Driver MP/RJ-45 with Surge Protection				
	Male		ME773A-MSP-R2	**$118.00**
	Female		ME773A-FSP-R2	**$118.00**

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Mini Driver MP9

Make High-Speed Connections with This Multipoint Line Driver.

- **Runs up to *230 Kbps* as far as 3 miles (4.8 km) away!**
- **Handles multipoint and point-to-point applications.**
- **Built-in surge protection—600 watts per wire!**

This Driver connects to DB9 RS-232 interfaces and supports data rates up to 230 Kbps as far as 3 miles (4.8 km) away! Distances up to 15 miles (24.1 km) are also attainable at lower data rates.

Mini Driver MP9 can handle up to 50 terminal drops in a multipoint environment. For RS-485 and serial-printer applications, the Driver passes one control signal in each direction.

SPECIFICATIONS

Operation — 2- or 4-wire, half- or full-duplex
Speed — Up to 230 Kbps
CE Approval — All items listed are approved
Connectors — All: (1) DB9 M or F;
ME775A: (1) 5-screw terminal;
ME776A: (1) RJ-11;
ME777A: (1) RJ-45
Power — DTE Mode: Pins 3, 5, 6, 8, 9;
DCE Mode: Pins 2, 4, 9, 20
Size — 2.7"H x 2.1"W x 0.7"D (6.9 x 5.3 x 1.8 cm)

FAXBACK INFORMATION
Request Document Number: 15963
Call 412-746-5500 Anytime

BLACK BOX
(412) 746-5500
Mini Driver MP

*NOTE: Order one unit for each attached device. Compatible with Mini Driver MPI on **page 372**.*

Item			Code	Price
Mini Driver MP9 (Asynchronous)				
DB9/Terminal Block				
	Male		ME775A-MSP	**$105.00**
	Female		ME775A-FSP	**$105.00**
DB9/RJ-11				
	Male		ME776A-MSP	**$105.00**
	Female		ME776A-FSP	**$105.00**
DB9/RJ-45				
	Male		ME777A-MSP	**$105.00**
	Female		ME777A-FSP	**$105.00**

MicroRACK
High-Speed Copper
Fiber

Async, Sync, Interface-Powered

Multipoint Isolated Mini Driver (Mini Driver MPI)

Protect Your Equipment from Ground Loops.

- **Point to point or multipoint.**
- **RTS Carrier control for hardware-controlled devices.**
- **ME761A runs up to 19.2 Kbps as far as 4 miles (6.4 km). ME764A runs up to 19.2 Kbps as far as 6.2 miles (10 km) away.**
- **All feature transformer isolation.**

The BLACK BOX® Mini Driver MPI connects full- or half-duplex async terminals to computers. It comes in two models, both of which operate over unconditioned 4-wire telephone lines.

The ME761A ensures data integrity for applications up to 4 miles (6.4 km), depending on wire gauge and data rate.

The ME764A runs up to 19.2 Kbps as far as 6.2 miles (10 km) over 19 AWG. Built-in transformer isolation and surge protection eliminate most noise in commercial buildings. Ground loops are also eliminated, so you can use Drivers to connect devices in separate buildings.

NOTE: Order one unit for each attached device.

Optional Built-in SURGE PROTECTION

ME761A
MINI DRIVER MPI
BLACK BOX
Mini Driver MP
S/N
94 1003006
DCE
DTE

SPECIFICATIONS

Maximum Distance — ME761A: 4 miles (6 km); ME764A: 6.2 miles (10 km)
Multipoint — ME761A: 7 drops; ME764A: 15 drops
Operation — 4-wire half- or full-duplex, DCE/DTE switch-selectable
Protocol — Asynchronous
Speed — Up to 19.2 Kbps
CE Approval — All items listed are approved
Connectors — (1) DB25 male or female, (1) 5-screw terminal block
Power — 6 VDC from the RS-232 interface:
ME761A: Pins 2, 4, 20;
ME764A: DTE Mode: Pins 3, 5, 6, 8, 9;
DCE Mode: Pins 2, 4, 9, 20
Size — ME761A: 4.3"H x 2.1"W x 0.9"D (10.9 x 5.3 x 2.3 cm);
ME764A: 2.7"H x 2.1"W x 0.7"D (6.9 x 5.3 x 1.8 cm)

Item	Code	Price
Multipoint Isolated Mini Driver (Mini Driver MPI)		
Male	ME761A-M	**$118.00**
Female	ME761A-F	**$118.00**
with Surge Protection		
Male	ME764A-MSP	**$125.00**
Female	ME764A-FSP	**$125.00**

Sync Short-Haul Modem, Nonpowered, Multipoint (Sync SHM-NPR MP)

The Choice for Multipoint Sync Applications.

- **Versatile—use in point-to-point or multipoint applications.**
- **Switch-selectable clocking.**
- **Optional built-in surge protection.**

Optional Built-in SURGE PROTECTION

SYNC
SHM-NPR
MP
ME737A/F
BLACK BOX
Sync SHM-NPR MP
S/N

Here's the right choice for sync multipoint applications (up to 10 drops), or hardware handshaking. Clocking is completely switch-selectable. You can also set the carrier signal. DC transformer isolation eliminates the threat of ground loops, making this unit ideal for between-building connections. An optional 600-watt surge-protection sentry guards your equipment from harmful electrical surges.

SPECIFICATIONS

Maximum Distance — 8.5 mi (13.7 km)
Operation — 4-wire half- or full-duplex
Protocol — Synchronous
Speed — 19.2 Kbps at 3.5 mi. (5.6 km)
CE Approval — All items listed are approved
Connectors — All: (1) DB25 male or female;
ME737A: (1) 4-screw terminal block;
ME729A: (1) 5-screw terminal block;
ME734A: (1) RJ-11;
ME735A: (1) RJ-45

Item	Code	Price
Sync SHM-NPR MP/4-Screw Terminal Block		
Male	ME737A-M	**$235.00**
Female	ME737A-F	**$235.00**
with Surge Protection (5-Screw Terminal Block)		
Male	ME729A-MSP	**$240.00**
Female	ME729A-FSP	**$240.00**
Sync SHM-NPR MP/RJ-11		
Male	ME734A-M	**$235.00**
Female	ME734A-F	**$235.00**
with Surge Protection		
Male	ME734A-MSP	**$240.00**
Female	ME734A-FSP	**$240.00**
Sync SHM-NPR MP/RJ-45		
Male	ME735A-M	**$235.00**
Female	ME735A-F	**$235.00**
with Surge Protection		
Male	ME735A-MSP	**$240.00**
Female	ME735A-FSP	**$240.00**

Sync, AC-Powered

Short-Haul Modem Sync (SHM-B Sync)

Here's Synchronous Data Transmission with Optical Isolation—for Outdoor Runs.

NORMAL
LOOPBACK
BLACK BOX®
TD
RD
SYNC. SHORT HAUL MODEM

- **Optical isolation protects your equipment.**
- **Sync data travels up to 5 miles (8 km).**

Your sync RS-232 devices communicate up to 5 miles (8 km) with the BLACK BOX® SHM-B Sync. For example, if your AS/400® controller and terminal are on different floors—or in different buildings—they can easily talk to each other with a pair of SHM-B Syncs.

Built-in optical isolation protects your data when you run cable underground or between buildings. Run loopback tests right from the front panel. The flip-open housing makes it easy for you to get inside to connect your 4-wire cabling.

SPECIFICATIONS

Clocking — Internal
Maximum Distance — 5 mi. (8 km)
Operation — 4-wire full-duplex
Protocol — Synchronous
Speed — Up to 19.2 Kbps
CE Approval — ME801-C; ME801AE (the 230-VAC version)
Connectors — (1) DB25 female, (1) 4-screw terminal block
Power — 115 VAC, 60 Hz (wallmount), 5 watts
Size — 1.5"H x 4.3"W x 4.5"D (3.8 x 10.9 x 11.4 cm)

Item	Code	Price
SHM-B Sync Standalone	ME801A	**$175.00**
Card	ME801-C	**$165.00**
Short-Haul Modem-B Rack (16-Card) (**p. 367**)	ME810	**$360.00**
Short-Haul Modem-B Desktop Rack (8-Card) (**p. 367**)	RM007	**$330.00**

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RS-232/RS-485 Multipoint Line Driver (LD485S-MP)

Dispatch Your Sync Data to up to 64 Locations.

- **Multipoint—up to 64 drops.**
- **Reliable in high-interference environments.**
- **Up to 128 Kbps.**
- **Standalone or Rackmount models available.**

LD485S-MP
DLB LLB TEST
RTS CD TD RD
PWR
BLACK BOX
(412) 746-5500

Your data travels at up to 128 Kbps with the BLACK BOX® RS-232/RS-485 Multipoint Line Driver (LD485S-MP)—up to 64 locations!

The LD485S-MP is as reliable in tail circuits, too. You get less jitter in Receive clocking, a range of Transmit-clock select options, and delayed RTS/CTS settings.

LEDs on the front panel indicate flow-control status. And three front-panel pushbuttons perform line and digital loopback testing.

The Ready Pak includes the Standalone Line Driver and (**1**) Extended Distance/Quiet Cable (EBN16C-0010-MM).

CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!

SPECIFICATIONS

Clocking — Internal, external, receive
Maximum Distance — 4 mi. (6.4 km)
Operation — 2- or 4-wire half- or full-duplex
Protocol — Synchronous
Speed — Up to 128 Kbps
CE Approval — ME742C-R2
Connectors — (1) DB25 female, (1) 4-screw terminal
Power — 115 VAC, 60 Hz
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)
Weight — 1 lb. (0.5 kg)

Item	Code	Price
RS-232/RS-485 Multipoint Line Driver (LD485S-MP)		
Standalone	ME742A-R2	**$250.00**
Card	ME742C-R2	**$220.00**
Sync RS-232 Multipoint Line Driver Ready Pak Includes the Standalone Line Driver, **plus** (**1**) 10-ft. EDQ Cable	ME742A-R2-CABPAK	**$279.95**

To mount your LD485S-MP Line Driver Card order our…

Item	Code	Price
Multi-Function Rack (16-Card)	RM005	**$435.00**

Save 10%

on the Surge Protector when you buy both the Line Driver (LD485S-MP) and a Surge Protector!

Item	Code	Price
LD485S-MP and Surge Protector	ME289A	**$330.00**

For information about the Surge Protector, see p. 192.

MORE!
Info on Tail Circuits,
see Glossary on pp. 620–621.

Sync, Interface-Powered

Sync Short-Haul Modem Nonpowered 4-Wire (Sync SHM-NPR)

Point-to-Point Sync Operation up to 2.5 Miles at 19.2 Kbps.

- **Full-duplex operation over two twisted pair.**
- **Protects your equipment from overvoltages and background noise.**

Over unconditioned 4-wire phone lines (24 AWG wire), your data reaches out 2.5 miles (5.6 km) at 19.2 Kbps. At speeds of 1200 bps, this Driver extends the distance to 5 miles (8 km).

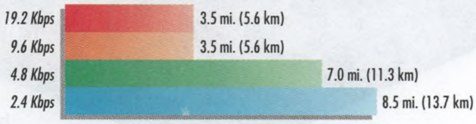
This point-to-point Driver requires no power supply. Transmit timing is provided by an internal clock. Your equipment is safe with our Driver: Transformer isolation protects against AC or DC overvoltages. And differential diphase modulation immunizes your data against background noise and line distortion.

SPECIFICATIONS

Carrier Control — Internal
Maximum Distance — 5 mi. (8 km)
Operation — 4-wire full-duplex
Protocol — Synchronous
Speed — Up to 19.2 Kbps
CE Approval — All items listed are approved
Connectors — (1) DB25 male or female, (1) 4-screw terminal block
Power — 6 VDC, Pins 2, 4, 20
Size — 4.3"H x 2.1"W x 0.9"D (10.9 x 5.3 x 2.3 cm)
Weight — 0.2 lb. (0.1 kg)

Item	Code	Price
Sync Short-Haul Modem Nonpowered 4-Wire (Sync SHM-NPR)		
Male	ME749A-M	**$185.00**
Female	ME749A-F	**$185.00**

Speed/Distance Charts (all models)



Mini Driver 4-Wire (Mini Driver 4W-S)

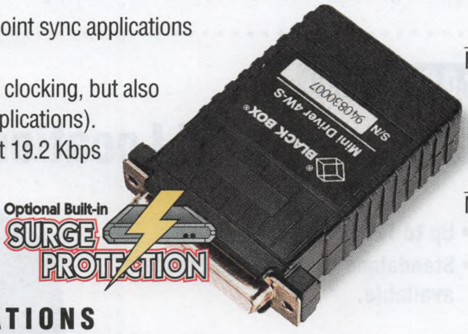
Our Mini Driver 4W-S Gives You Both the Clocking and the Distance You Need for Your Sync Applications.

- **Clocking is crystal-controlled.**
- **Great distance—up to 8.5 miles.**
- **Perfect for tail-circuit applications.**
- **Interface-powered.**
- **Built-in surge protection available.**

The Mini Driver 4W-S is designed for your point-to-point sync applications that require clocking.

The three models labeled CL feature not only internal clocking, but also external and receive loopback clocking (for tail-circuit applications).

All models carry your data up to 3.5 miles (5.6 km) at 19.2 Kbps (over 24 AWG wire). Transformer isolation and optional surge protection keep your equipment safe from ground loops and electrical surges—and that's perfect for between-building connections.



Optional Built-in SURGE PROTECTION

SPECIFICATIONS

Maximum Distance — Up to 8.5 mi. (13.7 km)
Operation — 4-wire full-duplex
Protocol — Synchronous
Speed — Up to 19.2 Kbps
CE Approval — All items listed are approved
Connectors — DTE: (1) DB25 male or female; Line: either (1) 5-screw terminal block, (1) RJ-11, or (1) RJ-45
Power — DCE Mode, Pins 2, 4, 9, 20
Size — 2.7"H x 2.1"W x 0.7"D (6.8 x 5.3 x 1.9 cm)
Weight — 0.2 lb. (0.1 kg)

Item	Code	Price
Mini Driver 4W-S, DB25 with Surge Protection		
Male	ME750A-MSP	**$190.00**
Female	ME750A-FSP	**$190.00**
Mini Driver 4W-S-CL, 5-Screw Terminal Block		
Male	ME753A-M	**$195.00**
Female	ME753A-F	**$195.00**
with Surge Protection		
Male	ME753A-MSP	**$200.00**
Female	ME753A-FSP	**$200.00**
Mini Driver 4W-S-CL, RJ-11		
Male	ME754A-M	**$195.00**
Female	ME754A-F	**$195.00**
with Surge Protection		
Male	ME754A-MSP	**$200.00**
Female	ME754A-FSP	**$200.00**
Mini Driver 4W-S-CL, RJ-45		
Male	ME756A-M	**$195.00**
Female	ME756A-F	**$195.00**
with Surge Protection		
Male	ME756A-MSP	**$200.00**
Female	ME756A-FSP	**$200.00**

Sync Short-Haul Modem Nonpowered 2-Wire, Coax (Sync SHM-NPR)

Full-Duplex Operation over Single Twisted-Pair or Coax!

- **Full-duplex operation over single twisted-pair or coax.**
- **Speeds up to 19.2 Kbps, sync.**
- **Range up to 0.8 mile (1.3 km).**
- **Internal, external, or loopback clocking.**
- **Transformer isolation.**

The Sync SHM-NPR can be used for local data distribution, connecting synchronous terminals, controllers, and computers. Two Sync SHM-NPRs ensure integrity of data transmission over 2-wire telephone lines. Transmit data up to 19.2 Kbps at a distance of up to 0.6 mile (0.9 km).

Choose from two models, both which operate full-duplex over single twisted-pair or coax. Coupling to the telephone line is through isolation transformers, which protect against overvoltages.

Sync SHM-NPR

SPECIFICATIONS

Clocking — Internal, external, loopback
Maximum Distance — 0.8 mi. (1.3 km)
Protocol — Synchronous
Speed — Up to 19.2 Kbps
CE Approval — All items listed are approved
Interface — RS-232
Power — From the interface

Item		Code	Price
Sync Short-Haul Modem Nonpowered 2-Wire, Coax (Sync SHM-NPR)			
2-Wire	Female	ME6110A-F	**$245.00**
	Male	ME6110A-M	**$245.00**
Coax	Female	ME6111A-F	**$255.00**
	Male	ME6111A-M	**$255.00**

Async/Sync, AC-Powered

19.2-Kbps RS-232 Line Driver

Choose Speed Or Distance— 19.2 Kbps or 15 Miles.

- Sends RS-232 data four miles at 19.2 Kbps ***and*** up to 15 miles (24 km) over 24 AWG wire at 1200 bps!
- Runs sync or async, point to point or multipoint.
- Operates half-duplex over two wires, or full- or half-duplex over four wires.
- V.54 diagnostics perform local and remote loopback tests.
- Differential diphase modulation eliminates line distortion and provides clean transmissions.

BLACK BOX
PWR
RTS
TD
RD
DCD
TEST
DIG
ANA
REM
LDM-MR19.2

NOTE: Must be used in pairs.

SPECIFICATIONS

Clocking — Internal, external, recovered
Operation — 2-wire half- or 4-wire half- or full-duplex
Protocol — Async or sync
CE Approval — ME760C and the 230-VAC version: ME760AE-R2
Interface — RS-232
Connectors — (1) DB25 female, (1) 5-screw terminal
Power — 115 VAC ± 10%, 60 Hz (230-VAC, 50-Hz version on request)

Item	Code	Price
19.2-Kbps RS-232 Line Driver (LDM-MR19.2)		
	ME760A-R2	**$350.00**
Standalone Card	ME760C	**$290.00**

remember to order **cables**

RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.

Async/Sync Short-Haul Modem

Send Async or Sync Data up to 7.6 Miles or up to 57.6 Kbps.

- **Speeds up to 57.6 Kbps.**
- **Distances up to 7.6 miles (12.2 km) over 24 AWG wire.**
- **Async or sync operation, point to point or multipoint.**
- **Transformer isolation and surge protection.**
- **V.54 loopback and V.52 BERT pattern generator.**
- **Internal, external, or received loopback clocking in sync mode.**
- **External power supply.**

Send your data at rocket speed. The BLACK BOX® Async/Sync Short-Haul Modem sends your data nearly 5 miles (8 km) at up to 57.6 Kbps over 24 AWG wire or go up to 7.6 miles at 1200 bps. Need more than just high performance? This Short-Haul Modem comes complete with lots of extras to simplify your data transmission. Features like transformer isolation and surge protection help to guard your valuable data. And the convenient front-panel controls make it easy to configure diagnostics.

Of course, the Async/Sync Short-Haul Modem contains all the standard features you're used to: async or sync operation, the option of running point-to-point or multipoint applications, and half-duplex operation over two wires—or your choice of half- or full-duplex over four wires.

NOTE: Compatible with Multi-Function Line Driver Cards (ME758C) ***p. 379.***

FAXBACK INFORMATION
Request Document Number: 13741
Call 412-746-5500 Anytime

BLACK BOX
(412) 746-5500
Async/Sync Short Haul Modem
V.54 Test Modes
TD
RD
RTS
CD
Error
Test
Remote
Normal
Local

SPECIFICATIONS

Clocking — Internal, External, Receive
Maximum Distance — 7.6 mi. (12.2 km)
Operation — 2-wire half-duplex, or 4-wire half-or full-duplex
Speed — Up to 57.6 Kbps
CE Approval — Yes
Interface — RS-232
Connectors — (1) DB25 female, RJ-11 jack and terminal block
Power — 115-VAC, 60-Hz external transformer
Size — 1.5"H x 4.2"W x 5"D (3.8 x 10.7 x 12.7 cm)

Item	Code	Price
Async/Sync Short-Haul Modem		
	ME475A	**$325.00**

remember to order **cables**

RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.

Async/Sync 2-Wire Short-Haul Modem

Send Async or Sync Data Faster than Ever. The New Speed Limit Is 128 Kbps.

VIPreview
Ask for our
Modems & More VIPreview.

- **Transmit async data up to 115.2 Kbps and sync data up to 128 Kbps using 2B1Q line coding.**
- **Adaptive equalizer provides noise immunity and high performance over low-quality lines.**
- **Full diagnostics included: internal BERT, local and remote loopbacks.**

Here's a better way to send data locally. You can safely send async or sync data up to 3.4 miles (5.5 km) over your existing, inexpensive 2-wire twisted-pair lines. And you get amazing speeds: Async data goes 115.2 Kbps while sync data travels at 128 Kbps.

Perform diagnostics on local analog loopback as well as local and remote digital loopback. You can test both modems and the line at either end when you're in the digital loopback mode. And you can control the loopbacks via a manual switch or through the DTE interface.

SPECIFICATIONS

Clocking — Internal, external, receive
Maximum Distance — 3.4 miles (5.5 km) over 26 AWG wire
Operation — Full-duplex
Protocol — Async or sync
Speed — Up to 128 Kbps
CE Approval — ME375C and the 230-VAC version: ME375AE
Interface — ME375A: RS-232; ME375C: RS-232, RS-530, or X.21
Power — 115 VAC, 60 Hz (230-VAC, 50-Hz version on request)

BLACK BOX
(412) 746-5500
ASYNC/SYNC 2-WIRE SHORT HAUL MODEM
PWR
RTS
TD
RD
DCD
LOS
ERR
TEST
DIG
ANA
REM
PATT
RESET

FAXBACK INFORMATION
Request Document Number: 14072
Call 412-746-5500 Anytime

NOTE: Must be used in pairs.

Item	Code	Price
Async/Sync 2-Wire Short-Haul Modem		
RS-232	ME375A	**$720.00**
Async/Sync 2-Wire Short-Haul Modem Cards		
RS-232	ME375C-232	**$570.00**
RS-530	ME375C-530	**$570.00**
X.21	ME375C-X21	**$770.00**

remember to order **cables**

RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.

Async/Sync

Async/Sync Line Drivers

Send Data up to 5.3 Miles (8.5 km) at 64 Kbps.

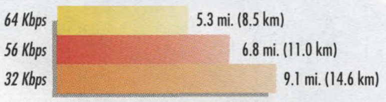
- **Speeds of 32, 56, or 64 Kbps.**
- **Standalone or Card models.**
- **Distances of 5.3 miles (8.5 km) at 64 Kbps to 9.1 miles (14.6 km) at 32 Kbps.**
- **Async or sync operation.**
- **Transformer isolation and surge protection.**
- **V.54 loopback and V.52 BERT pattern generator.**
- **Internal, external, or receive loopback clocking in sync mode.**
- **External power supply.**

Send your data 5 to 9 miles (8 to 14 km) away—with confidence. These Line Drivers are perfect for LAN-to-LAN or Tail-Circuit applications.

You get two V.54 test modes—local analog loop and remote digital loop—which can be activated from the RS-232 interface or by an externally accessible switch. Tri-state LED indicators show you when the unit is performing the V.54 or V.52 tests.

For protection against ground loops and transient surges, it incorporates both isolation transformers and diode surge suppressors. DTE interface options include DB25 for RS-232 interfaces.

Speed/Distance Chart



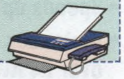
**NOTE: Distance based on 19 AWG wire; 24 and 26 AWG will decrease distance.*

SPECIFICATIONS

Clocking — Internal, external, receive
Line Type — Twisted-pair
Maximum Distance — 9.1 mi. (14.6 km)
Operation — 4-wire full-duplex
Protocol — Async or sync
Speed — 32, 56, or 64 Kbps
CE Approval — All items listed are approved
Interface — RS-232
Connectors — ME350A-M: (1) DB25M, (1) RJ-11;
ME351A-M: (1) DB25M, (1) RJ-45;
ME350A-F: (1) DB25F, (1) RJ-11;
ME351A-F: (1) DB25F, (1) RJ-45;
ME355C: (1) DB25F, (1) RJ-11;
ME356C: (1) DB25F, (1) RJ-45
Indicators — BERT, loop
Power — From external power supply
Size — Standalone: 3.5"H x 2.1"W x 0.8"D (8.9 x 5.3 x 2 cm);
Card: 3.1"H x 1.9"W x 5.4"D (7.9 x 2.4 x 13.7 cm)
Weight — 0.1 lb. (<0.1 kg)

PWR
TD
RD
BERT
LOOP
BLACK BOX®
(412) 746-5500
Async/Sync Line Driver 56/64

FAXBACK INFORMATION
Request Document Number: 13710
Call 412-746-5500 Anytime



Item			Code	Price
Async/Sync Line Driver 56/64 Standalone				
DB25	Male	RJ-11	ME350A-M	**$299.00**
		RJ-45	ME351A-M	**$299.00**
	Female	RJ-11	ME350A-F	**$299.00**
		RJ-45	ME351A-F	**$299.00**
Async/Sync Line Driver 56/64 Card				
DB25	Female	RJ-11	ME355C	**$285.00**
		RJ-45	ME356C	**$285.00**

◆ ◆ ◆

Multi-Function Line Driver

Send Data up to 6 Miles at 38.4 Kbps.

- **Speeds up to 38.4 Kbps.**
- **Distances up to 6 miles (9.6 km).**
- **Async or sync operation, point-to-point or multipoint.**
- **Transformer isolation and surge protection.**
- **V.54 loopback and V.52 BERT pattern generator.**
- **Internal, external, or receive loopback clocking in sync mode.**
- **Nonpowered.**

The BLACK BOX® Multi-Function Line Driver gives you the distance you need. This miniature short-range modem requires no external power, so you can install it where it's most convenient. You get sync or async operation and support for data rates up to 38.4 Kbps.

The RS-232 interface gives you access to the V.54 loopback and V.52 BERT pattern generator, and built-in LEDs let you monitor test mode operation. You can send your data safely, too—the Multi-Function Line Driver has both transformer isolation and surge protection to guard against data loss.

BERT
LOOP
BLACK BOX®
(412) 746-5500
Multi-Function Line Driver

PLUS! MicroRACK System, see pp. 378–379.

Speed/Distance Chart

**NOTE: Distance based on 22 AWG wire. Distance will decrease with 24 and 26 AWG wire and will increase with 19 AWG wire.*

MicroRACK Compatible

FAXBACK INFORMATION
Request Document Number: 13727
Call 412-746-5500 Anytime

SPECIFICATIONS

Clocking — Internal, external, receive
Line Type — Twisted-pair
Maximum Distance — 6 mi. (9.6 km)
Maximum Speed — Up to 38.4 Kbps
Operation — 4-wire full-duplex
CE Approval — All items listed are approved
Interface — RS-232
Connectors — ME657A-M: (1) DB25M, (1) Terminal Block;
ME658A-M: (1) DB25M, (1) RJ-11;
ME659A-M: (1) DB25M, (1) RJ-45;
ME657A-F: (1) DB25F, (1) Terminal Block;
ME658A-F: (1) DB25F, (1) RJ-11;
ME659A-F: (1) DB25F, (1) RJ-45
Indicators — BERT, loop
Power — From the interface
Size — 3"H x 2.1"W x 0.8"D (7.6 x 5.3 x 2 cm)
Weight — 0.1 lb. (<0.1 kg)

Item	Code	Price
Multi-Function Line Driver (DB25)		
Male		
Terminal Block	ME657A-M	**$250.00**
RJ-11	ME658A-M	**$250.00**
RJ-45	ME659A-M	**$250.00**
Female		
Terminal Block	ME657A-F	**$250.00**
RJ-11	ME658A-F	**$250.00**
RJ-45	ME659A-F	**$250.00**

PARALLEL LINE DRIVERS • PARALLEL LINE DRIVERS • PARALLEL LINE DRIVERS • PARALLEL LINE DRIVERS • PARALLEL LINE DRIVERS

Black Box Has the Line Drivers for Your Parallel Applications, Too.

With a standard parallel connection, you can send data about 25 feet before you start to encounter problems with electrical interference and signal degeneration. This distance is adequate for most common applications such as connecting a PC to a printer. However, if you require longer distances, you need the help of a BLACK BOX® Parallel Line Driver.

Choose from two models: The compact Parallel Line Driver is a good choice for distances of up to 2000 feet. Because it's nonpowered, it doesn't require a nearby electrical outlet or add to your cable clutter.

For long-distance applications—up to 5 miles!—use the Short-Haul Modem-B Parallel.

Does your installation involve both serial and parallel devices? No problem! The Short-Haul Modem-B features built-in serial↔parallel conversion.

You can even connect the parallel port on your PC to a distant SCSI device by using Parallel Line Drivers and the Parallel-to-SCSI Converter (IC801A) on **page 339**.

No matter what your connectivity problems, Black Box Technical Support can help you find solutions—just call **412-746-5500**.

BLACK BOX®
BUSY
TD
SHM-B PARALLEL-T

Short-Haul Modem-B Parallel (SHM-B Parallel)

Push Your Parallel Data an Amazing Five Miles!

- **Parallel to parallel, parallel to serial, or serial to parallel.**

Send data to printers up to 5 miles (8 km) away. Use the T and R models together for parallel-to-parallel applications. To run parallel and serial applications, combine either model with our Short-Haul Modem-B Async (see **pp. 366–367**).

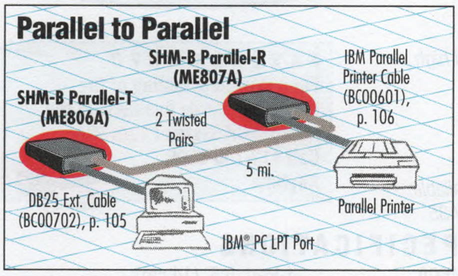
- **Send data at 19.2 Kbps up to 1 mile away.**
- **Send data at 1200 bps up to 5 miles away.**

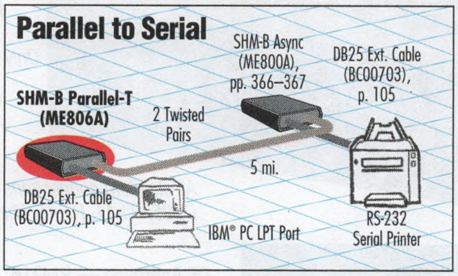
*NOTE: Must be used in pairs (one Transmitter, one Receiver) or with the Short-Haul Modem-B Async (**pp. 366–367**).*

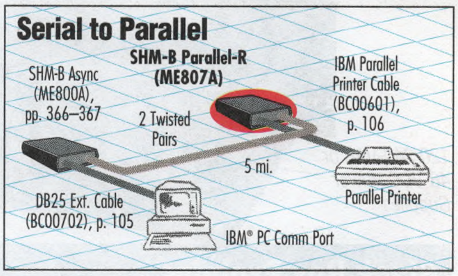
Item	**Code**	**Price**
Short-Haul Modem-B Parallel-T		
Standalone Transmitter	ME806A	**$165.00**
Card	ME806-C	**$155.00**
Short-Haul Modem-B Parallel-R		
Standalone Receiver	ME807A	**$190.00**
Card	ME807-C	**$180.00**
Short-Haul Modem-B Rack (16-Card)	ME810	**$360.00**
Short-Haul Modem-B Desktop Rack (8-Card)	RM007	**$330.00**

SPECIFICATIONS

Maximum Distance — 5 mi. (8 km)
Operation — 4-wire full-duplex, point-to-point
Protocol — Parallel
Speed — Up to 19.2 Kbps
Interface — Centronics® type parallel
Connectors — ME806A: (1) DB25 male; ME807A: (1) DB25 female; Both: (1) 5-screw terminal block
Power — 115 VAC, 60 Hz (230-VAC version on request)
Size — 1.5"H x 4.3"W x 4.5"D (3.8 x 10.9 x 11.5 cm)
Weight — 1.3 lb. (0.6 kg)


Parallel to Parallel
SHM-B Parallel-R (ME807A)
IBM Parallel Printer Cable (BC00601), p. 106
SHM-B Parallel-T (ME806A)
2 Twisted Pairs
5 mi.
DB25 Ext. Cable (BC00702), p. 105
Parallel Printer
IBM® PC LPT Port


Parallel to Serial
SHM-B Async (ME800A), pp. 366–367
DB25 Ext. Cable (BC00703), p. 105
SHM-B Parallel-T (ME806A)
2 Twisted Pairs
5 mi.
DB25 Ext. Cable (BC00703), p. 105
IBM® PC LPT Port
RS-232 Serial Printer


Serial to Parallel
SHM-B Parallel-R (ME807A)
SHM-B Async (ME800A), pp. 366–367
IBM Parallel Printer Cable (BC00601), p. 106
2 Twisted Pairs
5 mi.
DB25 Ext. Cable (BC00702), p. 105
Parallel Printer
IBM® PC Comm Port

Parallel Line Drivers

Send Parallel Data up to 2000 Feet over a Single Twisted Pair.

- **Distances up to 2000 feet (610 m).**
- **Selectable BUSY/ACKNOWLEDGE flow control.**

The BLACK BOX® Parallel Line Driver adapts to a wide variety of parallel printers. No separate power supply is necessary—it draws its power from both parallel interfaces. It even works with "low-power" parallel printer ports by transferring power from the PC.

BLACK BOX
Code: ME190A
Item: Parallel Line Driver -T

SPECIFICATIONS

Maximum Distance — 2000 ft. (610 m)
Line Interface — RJ-11, RJ-45, or terminal block
Operation — Half-duplex
Protocol — Parallel
Speed — Up to 5 Kbps parallel; Up to 40 Kbps serial
CE Approved— All items listed are approved
Size — 0.7"H x 2.1"W x 2.7"D (1.8 x 5.3 x 6.9 cm)

FAXBACK INFORMATION
Request Document Number: 13703
Call 412-746-5500 Anytime

Item	**Code**	**Price**
Parallel Line Driver-Terminal		
DB25 Male		
Terminal Block	ME190A	**$65.00**
RJ-11	ME192A	**$65.00**
Parallel Line Driver-Receiver		
Centronics® Male		
Terminal Block	ME191A	**$65.00**
RJ-11	ME193A	**$65.00**

MicroRACK
High-Speed Copper
Fiber

MicroRACK System

A New Kind of Rack with Hundreds of Applications.

- **Midplane architecture—separate front and rear cards make changing interfaces easy.**
- **Multiple functions—supports line drivers, interface converters, fiber modems, CSU/DSUs, and synchronous modem eliminators.**
- **Hot-swappable—MicroRACK Cards can be replaced without powering down—so you cut your network's downtime.**
- **Two-, four-, and eight-slot MicroRACKs are available for smaller or desktop installations. They're sized just right for tight spaces that can't accommodate a full-sized (16-slot) rack.**
- **Optional Dual Cards—some Mini Driver Cards have two drivers in one Card. One MicroRACK chassis can hold up to 32 Mini Drivers!**

What Makes This Rack Different?

The difference is what you can do with the BLACK BOX® MicroRACK System. It's the most flexible, compact, and complete rack system currently available for multiple data-communications devices! The MicroRACK System is the perfect economical alternative to overcrowded data centers. Only 3½ inches high, each MicroRACK can hold multiple, *affordable* Mini Line Driver Cards, Fiber Modem Cards, and synchronous modem eliminators.

It's Flexible.

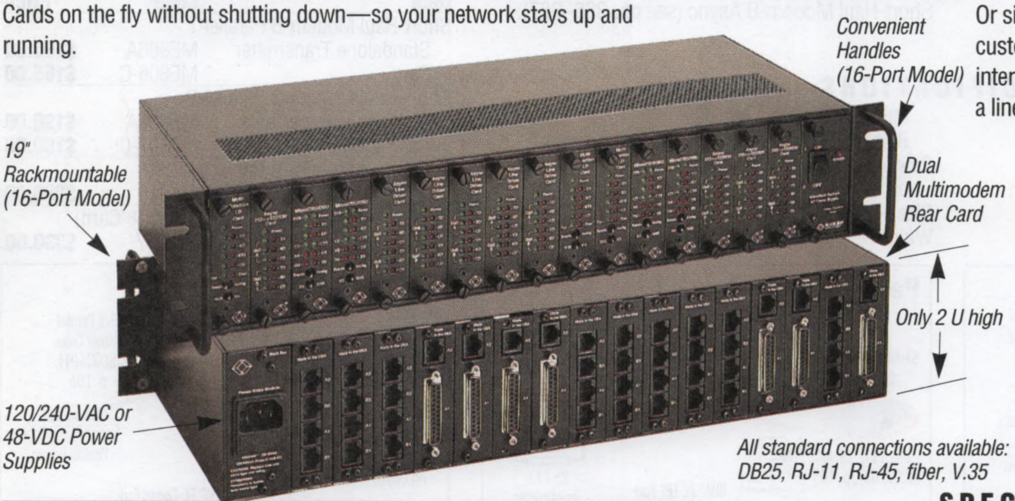
The MicroRACK System uses midplane architecture, incorporating internal connectors that run down the center of the chassis. The front-facing buses accommodate a variety of Function Cards to house line drivers, fiber modems, and synchronous modem eliminators. The corresponding rear-facing buses receive a variety of Interface Cards with a wide selection of data connectors: RJ-11, RJ-45, D-sub, fiber, and M-type. You can swap Function Cards and Interface Cards when your system changes. If you need a new front or rear Card, just call Black Box—we have it. You can even hot-swap Cards on the fly without shutting down—so your network stays up and running.

It's Compact.

The high-density design of the rackmount 16-Port MicroRACK means that 16 Function Cards (plus a Power Supply Card) fit side by side in a space only 3½ inches (2 U) high and 19" wide. With Dual-Driver Cards, 32 line drivers can fit into a single rack. Our 2-, 4-, and 8-Port MicroRACKs bring that same level of compactness to a sub-rack enclosure. Fit a Power Supply Card plus either 2, 4, or 8 device Cards side-by-side on a wiring-closet shelf, desktop—anyplace you need to bring together multiple communications devices.

It's a Complete Solution.

The same Cards that fit into our rackmount 19" MicroRACK also fit into our 2-, 4-, and 8-Port MicroRACK Boxes. And each Rackmount Card is compatible with standalone versions of the same device. So you can network with Black Box in the computer room, in the distribution closet, and on the workstation desktop. And think of the combinations: Imagine a dozen dual Mini Driver Cards fanning out to two dozen individual plug-in Mini Drivers. Or sixteen CSU/DSUs per Rack serving Internet customers. How about a MicroRACK of interface converters neatly connected to a lineup of milling machines?


Convenient Handles (16-Port Model)
19" Rackmountable (16-Port Model)
Dual Multimodem Rear Card
Only 2 U high
120/240-VAC or 48-VDC Power Supplies

All standard connections available: DB25, RJ-11, RJ-45, fiber, V.35

PLUS! Our MicroRACK Cards, **see p. 379.**

FAXBACK INFO
For a Complete Listing of the Racks and Cards Available in the MicroRACK System: 12915
Call 412-746-5500
Anytime

Black Box Explains...

How the MicroRACK Cards Fit Together.

Slide a Function Card into the front of the Rack. Then slide a Connector Card in from the back. The rest is simple. Just press the Cards together firmly inside the Rack to seat the connectors.

Changing systems? It's easy to change to a different Connector Card. Just call and we'll find the right connection for you.

Add a hot-swappable Power Supply (AC for normal operation, 8 VDC for battery-powered sites), and you're up and running.

SPECIFICATIONS

CE Approved — RM216, PS460A

Rack Size — 3.8"H x 7.3"D (9.6 x 18.5 cm)

Rack Width — 2-Port: 3.6" (9.1 cm); 4-Port: 5.5" (14 cm); 8-Port: 9.5" (24.1 cm); 16-Port: 19" (48.3 cm)

Item		Code	Price
First, select the right size MicroRACK for your application...			
MicroRACK	2-Port	RM202	**$110.00**
	4-Port	RM204	**$165.00**
	8-Port	RM208	**$240.00**
	16-Port	RM216	**$325.00**
...Next, order at least one Power Supply for each Rack...			
AC Power Supply		PS460A	**$140.00**
48-VDC Power Supply		PS461A	**$400.00**
...Then, order as many Cards as you need:			

See the next page for available Cards.

remember to order **cables** All the cables you need on **pp. 64–145.**

The Neat, Compact Data-Transmission Solutions from Black Box.

These Rackmount Cards fit neatly into our MicroRACK System. They save space, make access convenient, eliminate excess cabling, and cut costs.

Look for this symbol throughout the Line Driver Section for MicroRACK-compatible models.

MicroRACK Compatible

Installation is easy. Each Card consists of a Front and Back which connect in the middle of the MicroRACK. All cards are CE approved.

FAXBACK INFO
For All MicroRACK Cards: 15877
Call 412-746-5500
Anytime

Async Line Driver Cards

- Point to point.
- Dual-driver.
- Full-duplex operation.
- Distances up to 17 miles.

See these compatible Line Drivers for more information and specs:
CS Mini Driver (ME731A, 732A, 733A), **page 370.**
Microdriver 9 (ME790A, 791A, 792A, 793A, 794A), **page 370.**

Item	Code	Price
Async Line Driver Cards		
with RJ-11 Rear Connector	ME788C-RJ11	**$120.00**
with RJ-45 Rear Connector	ME788C-RJ45	**$120.00**

Mini Driver MP Cards

- Multipoint—up to 100 drops.
- Dual-driver.
- Async protocol.
- Speeds up to 115.2 Kbps.
- 2-wire half-duplex, 4-wire full-duplex.
- Distances up to 9 miles.

See these compatible Line Drivers for more information and specs:
Mini Driver MP (ME771A, 772A, 773A), **page 371.**

Item	Code	Price
Mini Driver MP Cards		
with RJ-11 Rear Connector	ME778C-RJ11	**$195.00**
with RJ-45 Rear Connector	ME778C-RJ45	**$195.00**

Mini Driver Cards

- Point to point.
- Dual-driver.
- Async protocol.
- Speeds up to 19.2 Kbps.
- Full-duplex operation.
- Distances up to 9 miles.

See these compatible Line Drivers for more information and specs:
HS Mini Driver with Transformer Isolation and Surge Protection (ME862A-R2, 863A-R2, 864A-R2), **page 370.**

Item	Code	Price
Mini Driver Cards		
with RJ-11 Rear Connector	ME780C-RJ11	**$170.00**
with RJ-45 Rear Connector	ME780C-RJ45	**$170.00**

Async/Sync Fiber Optic Modem Cards

- Point to point.
- Speeds up to 19.2 Kbps.
- Half- or full-duplex operation.
- Distances up to 2 miles.

See this compatible Fiber Optic Modem for more information and specs:
Async/Sync Fiber Optic Modem (ME570A), **page 388.**

Item	Code	Price
Async/Sync Fiber Optic Modem Cards		
HD DB26/Female ST® Rear	ME570C-ST	**$279.00**
HD DB26/Female SMA Rear	ME570C-SM	**$279.00**

Multi-Function Line Driver Cards

- Point to point or multipoint.
- Dual-driver.
- Sync or async protocol.
- Speeds up to 57.6 Kbps.
- Full V.54/V.52 diagnostics.
- 2-wire half-duplex, 4-wire full-duplex.
- Hardware/software flow control.
- Distances up to 20 miles.

See these compatible Line Drivers for more information and specs:
Mini Driver 4W-S (ME750A, 753A, 754A, 756A), **page 374.**
Sync SHM-NPR MP (ME729A, 734A, 735A), **page 372.**
Multi-Function Line Driver (ME657A, 658A, 659A), **page 376.**
Async/Sync Short-Haul Modem (ME475A), **page 375.**

Item	Code	Price
Multi-Function Line Driver Cards		
DB25 Modem-to-DTE Ports		
with RJ-11 Rear Connector	ME758C-RJ11	**$295.00**
with RJ-45 Rear Connector	ME758C-RJ45	**$295.00**
RJ-45 Modem-to-DTE Ports		
with RJ-11 Rear Connector	ME759C-RJ11	**$295.00**
with RJ-45 Rear Connector	ME759C-RJ45	**$295.00**

Mini Driver MPI Cards

- Point to point or multipoint.
- Dual-driver.
- Async protocol.
- Speeds up to 38.4 Kbps.
- Half- or full-duplex operation.
- Distances up to 6 miles.

See this compatible Line Driver for more information and specs:
Mini Driver MPI (ME764A), **page 372.**

Item	Code	Price
Mini Driver MPI Cards		
with RJ-11 Rear Connector	ME768C-RJ11	**$210.00**
with RJ-45 Rear Connector	ME768C-RJ45	**$210.00**

Line Driver, Dual-Handshake Cards

- Meets SLIP/PPP handshaking requirements.
- Point to point.
- Async protocol.
- Speeds from 1200 bps to 57.6 Kbps.
- Full-duplex.

See these compatible Line Drivers for more information and specs:
Line Driver, Dual-Handshake (ME680A, 681A), **page 371.**

Item	Code	Price
Line Driver, Dual-Handshake Cards		
with RJ-11 Rear Connector	ME680C	**$310.00**
with RJ-45 Rear Connector	ME681C	**$310.00**

Async/Sync Line Driver 56/64 Cards

- Point to point or multipoint.
- 4-wire full-duplex.
- Transformer isolation and surge protection.

See these compatible Line Drivers for more information and specs:
Async/Sync Line Driver 56/64 (ME350A, 351A), **page 376.**

Item	Code	Price
Async/Sync Line Driver 56/64 Cards		
with RJ-11 Rear Connector		
DB25 Female	ME355C	**$285.00**
M34 Female	ME357C	**$285.00**
with RJ-45 Rear Connector		
RS-232	ME356C	**$285.00**
V.35	ME358C	**$285.00**

Synchronous Modem Eliminator Cards

- Point to point.
- Speeds from 32 to 144 Kbps.
- For local data transfers up to 300 feet.

See this compatible Modem Eliminator for more information and specs:
V.35 Sync Modem Eliminator (ME109A), **page 362.**

Item	Code	Price
Synchronous Modem Eliminator Cards		
V.35 Rear Connector	ME109C	**$360.00**

FOR COMPARISON: V.35/X.21/RS-530/G.703 COPPER LINE DRIVERS

			Speed	Distance (Miles)		Line Connector			Line Type		Operation				Style		Surge Protection	
Item	Page	Code	Maximum Kbps	Running at Minimum Speed	Running at Maximum Speed	Screw Terminal	RJ-11 Female	RJ-45 Female	Point-to-Point	Multipoint	4-Wire Full-Duplex	4-Wire Half-Duplex	2-Wire Full-Duplex	2-Wire Half-Duplex	Rackmount Card	Modular Interfaces	Diode	Transformer Isolation
V.35 Line Drivers																		
MP485/35	**380**	ME521A	256	3.8	0.7	✓			✓	✓	✓	✓		✓			✓	
LDM-MR128	**381**	ME444A-R2	192	4.7	3.1	✓			✓		✓	✓			✓			
High-Speed Short-Range V.35	**381**	ME270A-R2	2048	1.1	0.8	✓			✓		✓	✓			✓			
Async/Sync Line Driver 56/64	**383**	ME352A	64	9.1	5.3		✓		✓		✓				✓			✓
Async/Sync Line Driver 56/64	**383**	ME353A	64	9.1	5.3			✓	✓		✓				✓			✓
Async/Sync Short-Haul	**382**	ME376A	128	3.4	3.4	✓			✓				✓					
Campus Driver HDSL	**384**	ME910A	1536	2.5	2.5			✓	✓		✓							
X.21 Line Drivers																		
LDM-MR128 (X.21)	**381**	ME444C-X21	192	4.7	3.1	✓			✓		✓	✓			✓			
High-Speed X.21 Driver	**382**	ME271AE-R2	2048	1.1	0.8	✓			✓		✓	✓			✓			
RS-530 Line Drivers																		
LDM-MR128	**381**	ME444A-530	192	4.7	3.1	✓			✓		✓	✓			✓			
High-Speed 422/449/530	**382**	ME272AE-R2	2048	1.1	0.8	✓			✓		✓	✓			✓			✓
G.703 Line Driver																		
LDM-MR128	**381**	ME444A-G703	192	4.7	3.1	✓			✓		✓	✓			✓			
V.35/X.21/RS-530/G.703 Line Drivers																		
4-Wire Modular Campus Driver	**385**	ME480A	160	11	6			✓	✓		✓	✓				✓		✓
2-Wire Modular Campus Driver	**385**	ME485A	128	10	10			✓	✓				✓	✓		✓		✓

MP485/35 V.35 Multipoint Line Driver

Get 256-Kbps Speed for Polled Environments!

- **Great for polled sync applications.**
- **Connect to a host or terminal (DTE).**

MP485/35
DLB LLB TEST
RTS CD TD RD
PWR
BLACK BOX

Get short-haul sync data communications over your own twisted-pair cable.

This V.35 Multipoint Line Driver has an RS-485 interface that uses nominal 24 AWG UTP wiring and has a DB25 female connector on the back.

A V.35 port configured as a DCE enables you to connect to a host computer or terminal (DTE), and a 4-screw terminal block for RS-485 communication over a 2- or 4-wire line.

The unit comes with a 6-inch DB25 male-to-M34 adapter cable. You can link it to controllers, printers, and front-end processors—up to 64 drops. Select data speeds of up to 256 Kbps.

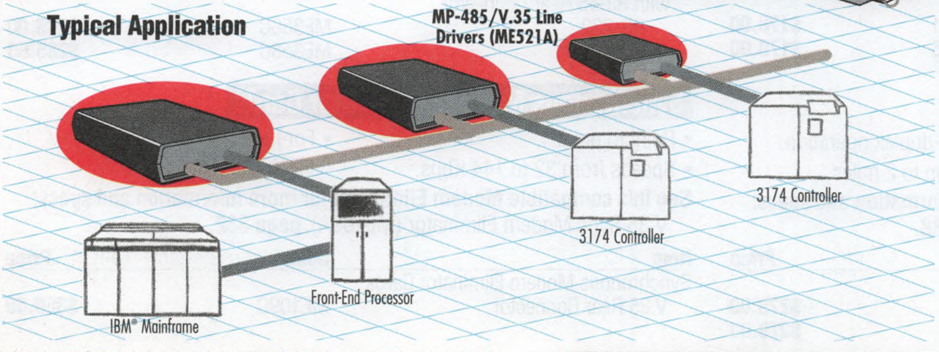
Four front-panel LEDs indicate flow control. Use the three pushbuttons to select line and digital loopback tests.

Internal switches determine speed, carrier, operation, TX data select, and node termination.

It's available as a Standalone unit or a Card. You can install the Card in a rackmount chassis that holds up to 16 Cards.

FAXBACK INFORMATION
Request Document Number: 18100
Call 412-746-5500 Anytime

Typical Application



SPECIFICATIONS

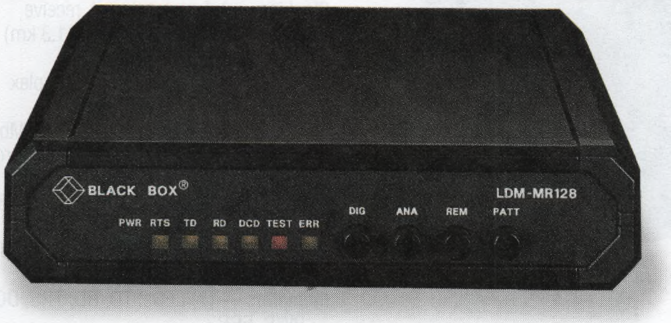
Clocking — Internal, external, recovered
Maximum Distance — 3.8 mi. (6.1 km) to the last drop on the line
Operation — 2-wire half-duplex or 4-wire half- or full-duplex
CE Approval — All items listed are approved
Connectors — Line Driver: (1) DB25 female, (1) 4-screw terminal; Adapter Cable: (1) DB25 male, (1) M34
Power — 115 VAC, 60 Hz (230-VAC, 50 Hz version on request)
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)
Weight — 2 lb. (0.9 kg)

Item	Code	Price
MP485/35 V.35 Multipoint Line Driver		
Standalone	ME521A	**$395.00**
Rackmount Card	ME521C	**$375.00**
To mount your V.35 Line Drivers, order our…		
Multifunction Rack (16-Card)	RM005	**$435.00**
remember to order cables — V.35 Interface Cable, Male/Male	EYN450-0010-MM	**$83.95**

For other lengths and genders, see p. 89.

192-Kbps Line Drivers

High Speeds, Multiple Interfaces, and Rackmount Card Versions—Right Here!



- **FAST speeds! Selectable speeds range up to *192 Kbps!***
- **Carries data up to 4.7 miles.**
- **Built-in BERT supports V.54 loop diagnostics.**
- **Desktop and Rackmount Card versions available—plus a choice of 4 interfaces!**

Now send data at high speeds over long distances with a BLACK BOX® 192-Kbps Line Driver. At 192 Kbps, the V.35 models will drive your data up to 3.1 miles (5 km)—and the other models will drive your data up to 4.7 miles (7.6 km). And you get even faster rates at shorter distances—up to 192 Kbps at 0.8 mi. (1.3 km)! With a built-in BERT (Bit Error Rate Tester), you can run loopback tests right from the front panel—or from control signals from the interface connector.

Thanks to conditioned diphase modulation, you'll get immunity from background noise for more efficient data transmission and reception. These Line Drivers also eliminate normal line distortion to ensure clean transmissions every time. Use the LDM-MR128 in full- or half-duplex applications.

SPECIFICATIONS

Clocking — Internal, external, recovered
Maximum Distance — ME444A-R3: 4.7 mi. (7.6 km); All others: 3.3 mi. (5.2 km)
Operation — 4-wire half- or full-duplex
Protocol — Synchronous
Speed — Up to 192 Kbps
CE Approval — ME444A-530, ME444A-G703, ME444AE-G703, ME444C-35, ME444C-530, ME444C-X21
Interface — ME444A-R3, ME444C-35: V.35; ME444A-530, ME444C-530: RS-530; ME444A-G703, ME444AE-G703: G.730; ME444C-X21: X.21

FAXBACK INFORMATION
Request Document Number: 15035
Call 412-746-5500 Anytime

Item		Code	Price
192-Kbps Line Drivers (LDM-MR128)			
Desktop Models			
V.35		ME444A-R3	**$650.00**
RS-530		ME444A-530	**$650.00**
G.703	115-VAC	ME444A-G703	**$1283.00**
	230-VAC	ME444AE-G703	**$1283.00**
Rackmount Cards			
V.35		ME445C-35	**$500.00**
RS-530		ME444C-530	**$500.00**
X.21		ME445C-X21	**$675.00**

remember to order **cables** V.35 Interface Cable, 10-ft. (3.0-m) EYN450-0010-MM **$83.95**
For other lengths or genders, see p. 89.
Rack Nest 2/14 **See page 383.**

2.048-Mbps Short-Range Drivers

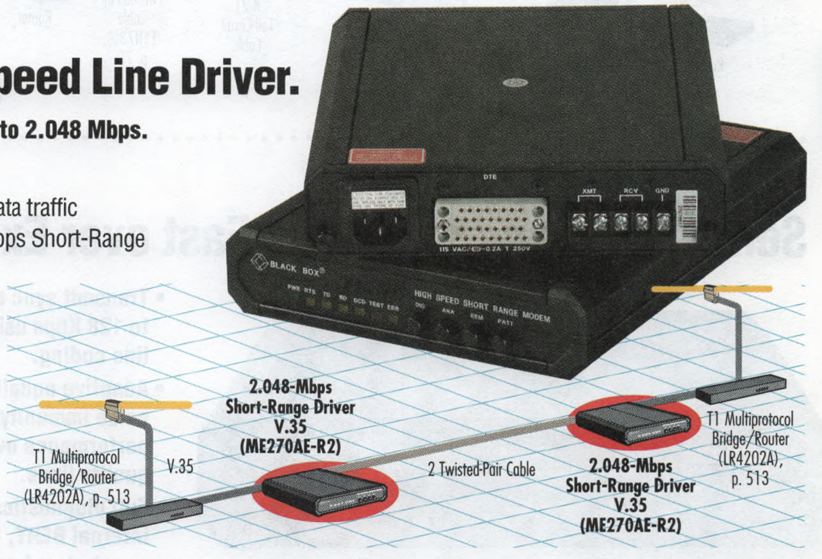
Win the Data Race with a High-Speed Line Driver.

- **Super-high speeds for your point-to-point applications—up to 2.048 Mbps.**
- **For extending V.35, RS-530, or X.21 interfaces.**

It's tough trying to keep your file transfers, bridging, and heavy data traffic moving at a steady pace. If you want your data to go *fast,* a 2.048-Mbps Short-Range Driver can really get things moving!

Our Short-Range Drivers can move data up to 2.048 Mbps, increasing your network speed in some cases by as much as 33%. It'll help eliminate traffic jams, increase file-transfer times, and enable your network bridges to work at their true full speed. Your mainframes can trade data faster than you ever thought possible. And your network users spend less time waiting for big files to download to their terminals.

So pick a super-fast Short-Range Driver that can help you win the data race. The 2.048-Mbps Short-Range Drivers from Black Box are your high-speed vehicles for point-to-point applications!


DTE
115 VAC/⊖-0.2A T 250V
XMT RCV GND
BLACK BOX®
PWR RTS TD RD DCD TEST ERR
DIG ANA REM PATT
HIGH SPEED SHORT RANGE MODEM
2.048-Mbps Short-Range Driver V.35 (ME270AE-R2)
T1 Multiprotocol Bridge/Router (LR4202A), p. 513
V.35
2 Twisted-Pair Cable
2.048-Mbps Short-Range Driver V.35 (ME270AE-R2)
T1 Multiprotocol Bridge/Router (LR4202A), p. 513

SPECIFICATIONS

Clocking — Internal, external, recovered
Maximum Distance — 0.8 mi. (1.3 km) at 2.048 Mbps
Operation — 4-wire half- or full-duplex, point-to-point
Protocol — Synchronous
Speed — Up to 2.048 Mbps
CE Approval — ME270C-530, ME270C-35, and 230-VAC version: ME270AE-R2
Interface — ME270A-R2, ME270AE-R2, ME270C-35, ME270C-530: RS-530
Power — 115 VAC, 60 Hz or 230 VAC, 50 Hz

FAXBACK INFORMATION
Request Document Number: 10171
Call 412-746-5500 Anytime

Item	Code	Price
2.048-Mbps Short-Range Drivers		
V.35 Desktop Models		
115-VAC	ME270A-R2	**$1395.00**
230-VAC	ME270AE-R2	**$1395.00**
Rackmount Async/Sync SHM Cards		
V.35	ME270C-35	**$1250.00**
RS-530	ME270C-530	**$1250.00**

remember to order **cables** V.35 Interface Cable, 10-ft. (3.0-m) EYN450-0010-MM **$83.95**
For other lengths or genders, see p. 89.
Rack Nest 2/14 **See page 383.**

High-Speed Short-Range Line Driver—X.21 and RS-422/449/530

Send Data Point to Point at 2.048 Mbps—33% Faster than T1!

- **Ten super-fast data rates—up to 2.048 Mbps.**
- **Point-to-point range up to 0.8 miles (1.3 km).**
- **230-VAC power supply.**
- **Ideal for campus networks.**
- **V.54-compliant diagnostics—local analog loopback and local/remote digital loopback tests.**
- **Test-Pattern Generator and Receiver provide for easy testing of the local driver and the communication link.**

ME271AE-R2

Top: Rear view; Bottom: Front view

Get your data there fast! This Line Driver moves your data up to 2.048 Mbps—33% faster than T1.

This Driver runs in full- or half-duplex over unconditioned twisted-pair lines. The output is selectable for HDB3 or AMI coding, or for B8ZS. On the input side, the Driver complies with X.21 or RS-449/530 recommendations.

Both versions of the High-Speed Short-Range Line Driver are perfect for campus networks. Its V.54-compliant diagnostics enable loopback tests for analog and digital links. Other testing features provide easy testing of the local driver and the communication link.

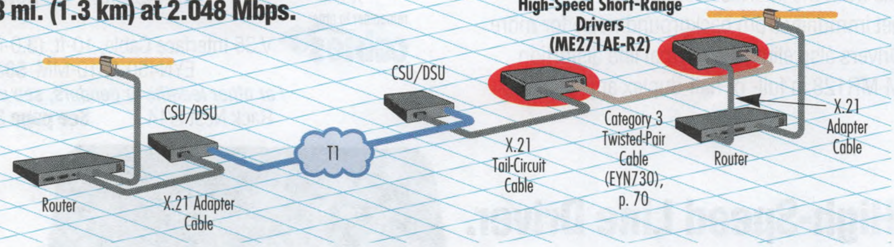
SPECIFICATIONS

Clocking — Internal, external, receive
Maximum Distance — 0.8 mi. (1.3 km) at 2.048 Mbps
Operation — 4-wire half- or full-duplex
Protocol — Synchronous
Speed — From 64 Kbps up to 2.048 Mbps
CE Approval — All items listed are approved
Interface — ME271AE-R2: X.21; ME272AE-R2: RS-422 RS-449/RS-530
Connectors — ME271AE-R2: DB15 F; ME272AE-R2: DB25 for RS-530, DB37 adapter included for RS-449/442
Indicators — (7) LEDs: TD, RD, TRS, DCD, TEST, PWR, ERR
Power — 230 VAC, 50 Hz
Size — 1.6"H x 9.6"W x 7.6"D (4.1 x 24.4 x 19.3 cm)
Weight — 3.1 lb. (1.4 kg)

FAXBACK INFORMATION
Request Document Number: 10171
Call 412-746-5500 Anytime

Item	Code	Price
High-Speed Short-Range Line Driver		
X.21	ME271AE-R2	**$1395.00**
RS-422/449/530	ME272AE-R2	**$1395.00**
remember to order cables V.35 Tail-Circuit Cable		**See page 111.**
V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**
For other lengths or genders, see p. 89.		
Category 3 Solid Bulk Cable	EYN712A-1000	**$57.95**
For other lengths, see p. 116.		

Extend an On-Site T1 Circuit up to 0.8 mi. (1.3 km) at 2.048 Mbps.


High-Speed Short-Range Drivers (ME271AE-R2)
CSU/DSU
CSU/DSU
T1
Router
X.21 Adapter Cable
X.21 Tail-Circuit Cable
Category 3 Twisted-Pair Cable (EYN730), p. 70
Router
X.21 Adapter Cable

◆ ◆ ◆

V.35 2-Wire Short-Haul Modem

Send Async *and* Sync Data Fast over Existing Twisted-Pair Lines!

BLACK BOX
(412) 746-5500
ASYNC/SYNC 2-WIRE SHORT HAUL MODEM
PWR
RTS
TD
RD
DCD
LOS
ERR
TEST
DIG
ANA
REM
PATT
RESET

- **Transmit sync data up to 128 Kbps using 2B1Q line coding.**
- **Adaptive equalizer provides noise immunity and high performance over low-quality lines.**
- **Full diagnostics included: internal BERT, local and remote loopbacks.**

Here's a better way to send your data locally. With the BLACK BOX® V.35 2-Wire Short-Haul Modem, you can safely send sync data up to 3.4 miles (5.5 km) over your existing, inexpensive 2-wire twisted-pair lines.

Perform diagnostics on local analog loopback as well as local and remote digital loopback.

You can test both modems and the line at either end when you're in the digital loopback mode. And you can control the loopbacks via a manual switch or through the DTE interface.

FAXBACK INFORMATION
Request Document Number: 14072
Call 412-746-5500 Anytime

SPECIFICATIONS

Clocking — Internal, external, receive
Maximum Distance — 3.4 miles (5.5 km) over 26 AWG wire
Operation — Full-duplex
Protocol — Sync or async
CE Approval — 230-VAC version: ME376AE
Interface — V.35
Connectors — V.35: (1) 34-pin M-block, female; Line: (1) 3-port terminal block, (1) RJ-45
Power — 115 VAC, 60 Hz (230-VAC, 50-Hz version on request)
Size — 1.8"H x 7.7"W x 9.7"D (4.5 x 19.5 x 25 cm)
Weight — 3.1 lb. (1.4 kg)

Item	Code	Price
V.35 2-Wire Short-Haul Modem	ME376A	**$720.00**
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**
For other lengths or genders, see p. 89.		

RackNest 2/14

Place up to 14 Modem Cards in This Powerhouse of a Rack!

ME375C
ME375C
ME444C
ME444C
ME447C
ME447C
ME275C
ME270C
IC716C
IC716C
IC716C
ME760C
ME760C
ME760C
BLACK BOX (412) 746-5500
RACK NEST 14
POWER SUPPLY

- **High-density 19" modem rack.**
- **Compact! Only 4U high.**
- **Cards and Power Supplies are hot-swappable.**
- **Fully redundant AC or DC Power Supplies.**

The RackNest 2/14 is a high-density compact rack capable of housing up to 14 cards.

This versatile Modem Card nest accommodates two separate power supplies. Each power supply—which can be either AC or DC—supports a full rack of any combination of modem cards. You can hot-swap power supplies during operation, with no effect on the modems and their data transmission.

The RackNest 2/14 has a terminal block for the line interface and a 25-pin connector for a digital interface. The terminal block is a snap-type connector for easy replacement.

Order your RackNest 2/14 with a matching power supply. Or order model RM100A-2PS, which already comes equipped with Dual Power Supplies for built-in power redundancy.

SPECIFICATIONS

CE Approval — All items listed are approved
Size — 7"H x 19"W x 10.4"D (17.8 x 48.3 x 26.4 cm)

Item		Code	Price
RackNest 2/14	115-VAC	RM110A	**$600.00**
	230-VAC	RM110AE	**$810.00**
Rack Nest 2/14 with Dual Power Supplies			
	115-VAC	RM110A-2PS	**$885.00**
Async/Sync SHM Cards—2.048-Mbps speeds!			
V.35 SHM, Balanced G.703 Interface on Line Side		ME270C-35	**$1250.00**
RS-530 SHM		ME270C-530	**$1250.00**
V.35 SHM, Unbalanced G.703 Interface on Line Side		ME275C-35	**$1250.00**
X.21 SHM		ME275C-X21	**$1614.00**
768-Kbps SHM Cards—two interfaces!			
V.35 SHM		ME280C-35	**$1250.00**
RS-530 SHM		ME280C-530	**$1250.00**
Async 144-Kbps SHM Cards—three interfaces!			
V.35 SHM		ME445C-35	**$500.00**
RS-530 SHM		ME445C-530	**$500.00**
X.21 SHM		ME445C-X21	**$675.00**
Sync SHM Cards—5.6-mi. (9-km) range!			
RS-232 SHM		ME447C-232	**$700.00**
V.35 SHM		ME447C-35	**$700.00**
RS-530 SHM		ME447C-530	**$700.00**

◆ ◆ ◆

Async/Sync Line Driver 56/64 (V.35)

Reliable Speed and Power Protection Go the Distance.

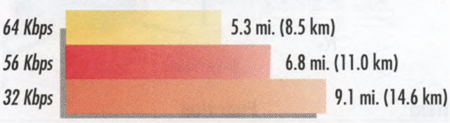
- **Speeds of 32, 56, or 64 Kbps.**
- **Distances up to 9.1 miles (14.6 km)**
- **Transformer isolation and surge protection.**

Send your data over 9 miles away—with confidence. The BLACK BOX® Async/Sync Line Driver 56/64 is perfect for LAN-to-LAN or Tail-Circuit applications.

Two V.54 test modes—local analog loop and remote digital loop—can be activated from the V.35 interface or by an externally accessible switch. Tri-state LED indicators show you when the unit is performing the V.54 or V.52 tests.

Isolation transformers and diode surge suppressors for protection guard against ground loops and transient surges.

Speed/Distance Chart



NOTE: Distance based on 19 AWG wire; 24 and 26 AWG will decrease distance.

SPECIFICATIONS

Clocking — Internal, external, receive
Line Type — Twisted-pair
Maximum Distance — 9.1 mi. (14.6 km)
Operation — 4-wire full-duplex
Protocol — Asynchronous/synchronous
Speed — 32, 56, or 64 Kbps
CE Approval — All items listed are approved
Connectors — ME352A-M: (1) DB25M, (1) RJ-11; ME353A-M: (1) DB25M, (1) RJ-45; ME352A-F: (1) DB25F, (1) RJ-11; ME353A-F: (1) DB25F, (1) RJ-45
Power — From external power supply
Size — 3.5"H x 2.1"W x 0.8"D (8.9 x 5.3 x 2 cm)
Weight — 0.1 lb. (<0.1 kg)

PWR
TD
RD
BERT
LOOP
BLACK BOX
(412) 746-5500
Async/Sync Line Driver 56/64

FAXBACK INFORMATION
Request Document Number: 13710
Call 412-746-5500 Anytime

Item			Code	Price
Async/Sync Line Driver 56/64 (V.35)				
DB25	Male	RJ-11	ME352A-M	**$299.00**
		RJ-45	ME353A-M	**$299.00**
	Female	RJ-11	ME352A-F	**$299.00**
		RJ-45	ME353A-F	**$299.00**

Campus Driver HDSL The Speed and Distance of Fiberoptic Cable over Copper Wire!

- **Super-fast 1.536-Mbps user speed!**
- **This T1 CSU/DSU features HDSL network interface for campus applications. Use it to run multiple applications over ordinary copper wire.**
- **Connect routers and phone equipment up to 2.3 miles (3.7 km) over 2 pairs of unconditioned 24 AWG copper wire.**
- **Customize the Campus Driver HDSL with voice and data modules.**
- **Easy expansion—just add option modules as needed.**
- **Provides a base V.35 and EIA 530 DTE interface.**
- **Stores two DS0 maps and switch configurations at predetermined times.**
- **User-friendly menu makes configuration easy.**
- **Full flexibility with bandwidth allocations.**
- **Built-in testing capabilities.**

Maximize the potential of your on-campus private phone lines. Drive data at T1 speeds—up to 1.536-Mbps user speed. The Campus Driver HDSL is a T1 CSU/DSU with an HDSL network interface. Used in campus applications, it drives data over ordinary unconditioned 2-pair copper wire and gives you the speed and distance normally associated with fiberoptic cable. It's a great option when running fiberoptic cable is too impractical or expensive—only HDSL makes it possible!

Flexible Function and Easy Upgrades.

The Campus Driver HDSL gives you performance flexibility now—and for the future. It comes equipped with one integral Nx56/64 port that can be configured as either an ITU V.35 or as an EIA 530 DTE interface. An expansion slot on the rear of the Driver allows the addition of other interfaces via Plug-In Modules. One additional module can be added by way of a Plug-On Module that "piggybacks" on the Plug-In Module. Plug-On Modules can only be used with Plug-In Modules. However, you can add a Plug-In Module in the expansion slot without a Plug-On Module.

FAXBACK INFORMATION
Request Document Number: 15949
Call 412-746-5500 Anytime

Black Box Explains...

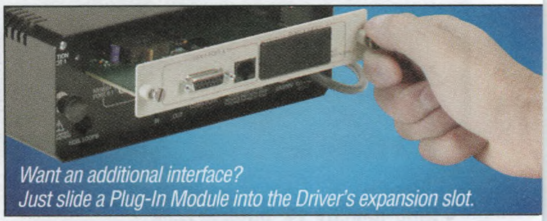
HDSL.

HDSL (High-Bit-Rate Digital Subscriber Line) was developed as an alternative repeaterless technology for delivery of T1 services. HDSL runs full-duplex over each pair of wire in 2-pair cable. This is known as Dual Duplex. Each pair of wire carries 784 Kbps—half the 1.544 Mbps of T1 bandwidth—plus a small amount of overhead. Because your data is sent at half the speed of normal T1, you get twice the distance. And because HDSL uses two pairs of wire, you still get all the throughput of T1.

A variety of Modules are available for trouble-free customization, including single V.35, DSX-1 (PBX), Drop and Insert, Single/Dual OCU DP, and Dual or Quad Voice. As your network grows and changes, just swap out Modules.

Configuring the Campus Driver HDSL is easy, too, thanks to a built-in menu. It gives you all the network information you need to choose options, allocate bandwidth, and monitor or test the Driver.

NOTE: Must be used in pairs.



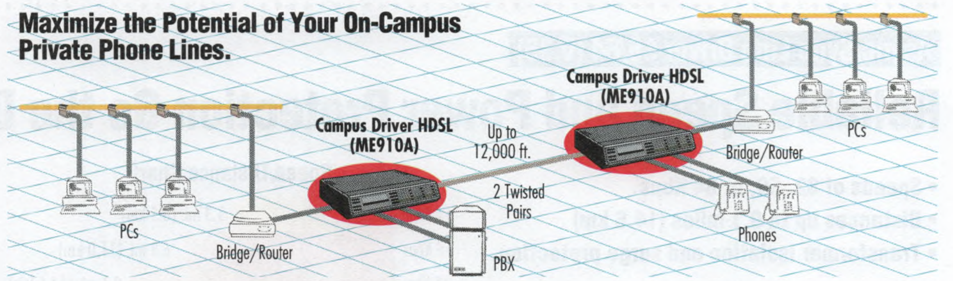
Want an additional interface?
Just slide a Plug-In Module into the Driver's expansion slot.

> **"Your Campus Driver saved us from having to rewire our facilities. Thanks!"**

SPECIFICATIONS

Bit Rate — Nx56 or Nx64 Kbps (N=1 to 24)
Clocking — Loop Timed; Internal; DTE (base Nx); by DSX-1 module (if installed)
Maximum Distance — 0.4 miles (0.6 km) over 2 pairs of unconditioned 26 AWG copper wire; 2.3 miles (3.7 km) over 2 pairs of unconditioned 24 AWG copper wire
Protocol — HDSL
Speed — Line Speed: 1.544 Mbps; User Speed: 1.536 Mbps
Tests — Local, Remote, Pattern
Connectors — 34-pin V.35; DB25
Power — 115 VAC, 60 Hz, 9W
Size — 3.1"H x 12"W x 8.5"D (7.9 x 30.5 x 21.6 cm)
Weight — 5 lb. (2.3 kg)

Maximize the Potential of Your On-Campus Private Phone Lines.



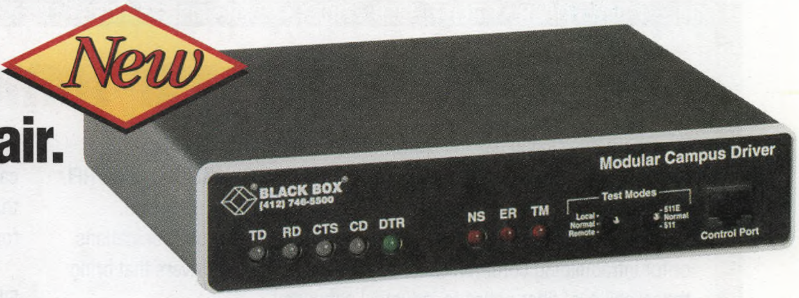
Item	Function	Code	Price
Campus Driver HDSL		ME910A	**$2695.00**
Plug-In Modules	***Plug directly into expansion slot of your Campus Driver HDSL.***		
DSX-1	Provides the DSX signal for PBX applications.	ME911C	**$395.00**
Nx56/64 V.35	Nx56/64 speeds with a V.35 interface.	ME912C	**$395.00**
Nx56/64 RS-530	Nx56/64 speeds with an RS-530 interface.	ME913C	**$395.00**
OCU DP	4-wire interface to a dedicated or switched-56 DSU/CSU.	ME914C	**$400.00**
Dual 2FXS	Dual voice ports in FXS, tandem access, and PLAR modes. Includes ring generator.	ME915C	**$450.00**
Dual 2FXO	Dual FXO voice ports.	ME916C	**$400.00**
Dual E&M/TO	Dual E&M or TO ports in 2- or 4-wire mode.	ME918C	**$400.00**
Plug-On Modules	***Plug onto Plug-In Modules.***		
DSX-1	Provides the DSX signal for PBX applications.	ME921C	**$375.00**
Nx56/64 V.35	Nx56/64 speeds with a V.35 interface.	ME922C	**$345.00**
OCU DP	4-wire interface to a dedicated or switched-56 DSU/CSU.	ME924C	**$400.00**
Dual 2FXS Plus	Dual voice ports in FXS, tandem access, and PLAR modes. Only for use with 2FXS Plug-In Module.	ME925C	**$350.00**
Dual 2FXO	Dual FXO voice ports.	ME926C	**$400.00**
Dual E&M/TO	Dual E&M or TO ports in 2- or 4-wire mode.	ME928C	**$400.00**

remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male EYN450-0010-MM **$83.95**

For other lengths or genders, see p. 89.

2-Wire Modular Campus Driver

Extend Network Links up to 10 Miles via Single Twisted Pair.


New
BLACK BOX
(412) 746-5500
TD RD CTS CD DTR
Modular Campus Driver
NS ER TM
Test Modes
Local - Normal - Remote -
511E Normal 511
Control Port

- **Operates over a single twisted pair.**
- **5 different Interface Modules enable mixing and matching.**
- **Selectable sync data rates.**
- **Point-to-point distances up to 10 miles (16.1 km)—all data rates!**

The new 2-Wire Modular Campus Driver is a baseband modem that supports full-duplex async or sync communications over a single twisted pair. Get async rates up to 38.4 Kbps—and sync options of 32, 56, 64, or 128 Kbps. No matter the data rate, the Campus Driver enables point-to-point distances up to 10 miles (16.1 km)!

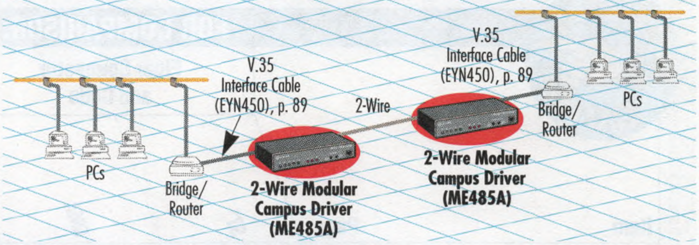
Sync timing can be internal, external, or received. The Campus Driver also uses 2B1Q modulation, so it's compatible with leased lines offered by most carriers. You can even configure the Campus Driver remotely.

With our Cards, you can hook up to RS-232, RS-422/530, V.35, X.21, or G.703 hardware. There's no need to buy separate modems for each interface!

FAXBACK INFO
Request Document Number: 18203
Call 412-746-5500
Anytime

SPECIFICATIONS

Clocking — Internal, external, recovered
Maximum Distance — Up to 10 mi. (16.1 km)
Operation — 2-wire full-duplex
Protocol — Sync or async
Speed — Async: Up to 38.4 Kbps; Sync: Up to 128 Kbps
CE Approval — All items listed are approved
Interface — RS-232, RS-422/530, V.35, X.21, or G.703 depending on Interface Card


V.35 Interface Cable (EYN450), p. 89
PCs
Bridge/Router
2-Wire Modular Campus Driver (ME485A)
2-Wire
V.35 Interface Cable (EYN450), p. 89
Bridge/Router
PCs
2-Wire Modular Campus Driver (ME485A)

Item	Code	Price
2-Wire Modular Campus Driver		
115-VAC	ME485A	$645.00
230-VAC	ME485AE	$645.00
48-VDC	ME485A-D48	$945.00
Campus Driver Interface Cards		
RS-232	ME481C-232	$100.00
RS-422/530	ME481C-422	$100.00
V.35	ME481C-35	$100.00
X.21	ME481C-X21	$100.00
G.703	ME481C-G703	$650.00
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	$83.95

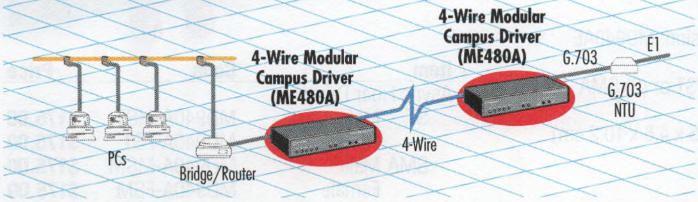
For other lengths or genders, see p. 89.

4-Wire Modular Campus Driver

Connect Networks up to 11 Miles Apart!

New
BLACK BOX
(412) 746-5500
TD RD RTS CD DTR
Modular Campus Driver
ER TM
Test Modes
Local - Normal - Remote -
511E Normal 511

- **Operates over two UTP.**
- **5 different Interface Modules enable mixing and matching.**
- **Nine data rates, from 48 to *160 Kbps!***
- **Point-to-point distances up to 11 miles (17.7 km).**
- **V.54 diagnostics, three clocking options, transformer isolation, *and* surge protection!**


4-Wire Modular Campus Driver (ME480A)
PCs
Bridge/Router
4-Wire
4-Wire Modular Campus Driver (ME480A)
G.703
E1
G.703 NTU

Make economical WAN connections over two twisted pairs, with the new 4-Wire Modular Campus Driver. It supports nine sync data rates between 48 and 160 Kbps—and it can achieve point-to-point full-duplex distances up to 11 miles (17.7 km). Connect to five different interfaces with modular Cards.

The Driver comes with built-in V.54 and V.52 diagnostics, three selectable clocking options, plus transformer isolation and surge protection.

FAXBACK INFO
Request Document Number: 18203
Call 412-746-5500
Anytime

SPECIFICATIONS

Clocking — Internal, external, recovered
Maximum Distance — Up to 11 mi. (17.7 km)
Protocol — Sync
Speed — Up to 160 Kbps
CE Approval — All items listed are approved
Interface — RS-232, RS-422/530, V.35, X.21, or G.703 depending on Interface Card

Item	Code	Price
4-Wire Modular Campus Driver		
115-VAC	ME480A	$595.00
230-VAC	ME480AE	$595.00
48-VDC	ME480A-D48	$795.00
Campus Driver Interface Cards		
RS-232	ME481C-232	$100.00
RS-422/530	ME481C-422	$100.00
V.35	ME481C-35	$100.00
X.21	ME481C-X21	$100.00
G.703	ME481C-G703	$650.00
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	$83.95

For other lengths or genders, see p. 89.

The Line Drivers for Tomorrow Are Here Today.

Fiberoptic cabling has the bandwidth to meet *tomorrow's* data-transmission requirements. Fiberoptic networks aren't affected by EMI/RFI. Plus they provide trouble-free operation and can be easily upgraded.

Our Fiber Line Drivers can be used for campus-wide communications or for intrabuilding communications. We even have Line Drivers that bring the reliability of fiber optics to industrial networks!

Many of our Fiber Line Drivers are perfect for single-mode fiberoptic cable. With single-mode fiber, you can get up to *50 times* more distance than multimode. And single-mode fiber strands can be used full-duplex for up to *twice the throughput speeds* of multimode.

So make the most of the cabling medium of tomorrow—with the best Fiber Line Drivers of today!

BUYER'S GUIDE

FOR COMPARISON: FIBER LINE DRIVERS

		Fiber Connector and Code		DTE Interface							Kbps	Miles	DTE Connector					Duplex Operation		Power		
Item	Page	ST®	SMA	Async RS-232	Sync RS-232	V.35	X.21	RS-485	Current Loop	Centronics Parallel	Max. Speed	Max. Distance	DB25	Screw Terminal	DB9 Female	DB15 Female	M/34 Female	Full-Duplex	Half-Duplex	115 VAC	From Interface	DC Versions
Async/Sync Fiber Optic Modem	**p. 388**	ME570A-MST	ME570A-MSM	✓	✓						19.2	2.0	Male					✓	✓		✓	
	p. 388	ME570A-FST	ME570A-FSM	✓	✓						19.2	2.0	Female					✓	✓		✓	
Sync/Async Fiber Driver	**p. 390**	MT633A-ST35	MT633A-SM35	✓	✓						64.0	2.5	Female					✓		✓		
Multimode Fiber Optic Modem	**p. 389**	MD640A-ST-R2	MD640A-SMA-R2	✓	✓						256.0	1.5	Female					✓		✓		
Async Fiber Optic Modem	**p. 387**	ME600A-MST	ME600A-M	✓							19.2	2.0	Male					✓			✓	
	p. 387	ME600A-FST	ME600A-F	✓							19.2	2.0	Female					✓			✓	
Async Fiber Driver	**p. 386**	MD940A-MST	MD940A-MSM	✓							76.8	2.5	Male					✓			✓	
	p. 386	MD940A-FST	MD940A-FSM	✓							76.8	2.5	Female					✓			✓	
Fiber Optic Multipoint Line Driver	**p. 389**	ME540A-ST	ME540A-SM	✓				✓	✓		128.0	1.0		✓	✓			✓	✓	✓		
Synchronous Fiber Optic Modem	**p. 387**	MD630A-MST	MD630A-M		✓						19.2	2.0	Male					✓	✓		✓	
	p. 387	MD630A-FST	MD630A-F		✓						19.2	2.0	Female					✓	✓		✓	
Sync/Async Fiber Driver	**p. 390**	MT633A-ST35	MT633A-SM35			✓					64.0	2.5	Female				✓	✓		✓		
V.35 Fiber Optic Line Driver	**p. 391**	ME522A-ST	ME522A-SM			✓					256.0	1.4	Female					✓	✓	✓		
V.35 Single-Fiber Driver	**p. 391**	ME525A-ST	ME525A-SMA			✓					256.0	3.0					✓	✓		✓		
RS-232 Industrial Fiber Driver	**p. 387**	ME320A		✓							115.2	4.0	Female					✓	✓	✓		✓
Centronics® Industrial Fiber Driver	**p. 387**	ME315A								✓	230	4.0	Female					✓		✓		✓
RS-485 Industrial Fiber Driver	**p. 387**	ME310A						✓			115.2	4.0			✓			✓	✓	✓		✓
Industrial Fiber-Net	**p. 388**	ME300A						✓			115.2	2.4			✓			✓	✓	✓		✓
V.35 Campus Fiber Driver	**p. 390**	ME550A-35				✓					2048	3.1					✓	✓		✓		
	p. 390	ME551A-35				✓					2048	12.4					✓	✓		✓		
	p. 390	ME552A-35				✓					2048	31.0					✓	✓		✓		
X.21 Campus Fiber Driver	**p. 390**	ME550A-X21					✓				2048	3.1				✓		✓		✓		
	p. 390	ME551A-X21					✓				2048	12.4				✓		✓		✓		
	p. 390	ME552A-X21					✓				2048	31.0				✓		✓		✓		

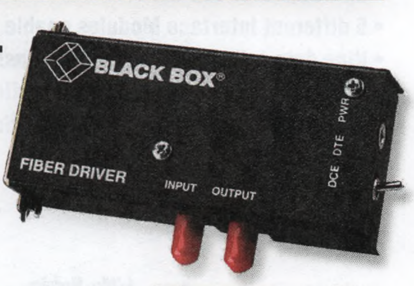
Async Fiber Driver Get DCE/DTE Switch Selection with This Fiber Driver.

- **Send data fast—up to 76.8 Kbps.**
- **Reach distances of 2.5 miles at any speed.**
- **Separately powered—115 VAC.**

The Async Fiber Driver from Black Box sends data across fiberoptic cable at up to 76.8 Kbps—up to 2.5 miles (4 km). With the switch-selectable DTE/DCE option, you can set the Driver to perform like a DTE so it can communicate with another DCE device. We offer ST® and SMA models, each with either a male or a female DB25 connector.

SPECIFICATIONS

Distance — 2.5 mi. (4 km)
Operation — Full-duplex
Protocol — Asynchronous
Speed — 76.8 Kbps
CE Approval — 230-VAC version: MD940AE
Interface — RS-232
Connectors — (1) DB25; (2) ST or (2) SMA
Power — 115 VAC, 60 Hz
Size — 1"H x 1.8"W x 4"D (2.5 x 4.6 x 10.2 cm)
Weight — 1 lb. (0.5 kg)



Item			Code	Price
Async Fiber Driver				
	ST	Male	MD940A-MST	**$175.00**
		Female	MD940A-FST	**$175.00**
	SMA	Male	MD940A-MSM	**$175.00**
		Female	MD940A-FSM	**$175.00**

Industrial Fiber Drivers

Extend RS-232, RS-485, or Centronics over Fiber!

- **Extend RS-485, RS-232, or Centronics® interfaces over fiber.**
- **Supports single-mode and multimode fiber.**
- **AC- and DC-powered models available.**

If you've been looking for a hard-working Driver to extend RS-232, RS-485, and Centronics parallel over fiber, your search is over!

Our Industrial Fiber Drivers will drive RS-232, RS-485, and Centronics Parallel over single-mode *and* multimode fiber.

The Fiber Drivers can drive your data signals up to 4 miles (6.4 km), depending on the type of fiber and resulting dB loss.

Our Industrial Fiber Drivers also come in 24- and 48-VDC models—so you can handle any critical applications that require battery power.

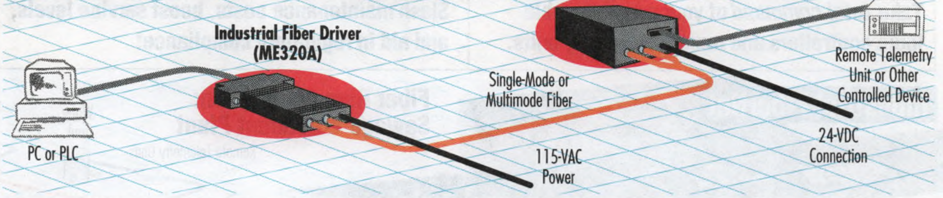
Three interfaces. Two power types. You won't find harder-working Fiber Drivers anywhere else!

FAXBACK INFORMATION
Request Document Number: 17518
Call 412-746-5500 Anytime

BLACK BOX
(412) 746-5500
PWR
S1
Industrial Fiber Driver
RS232 PORT
SW2
Industrial Fiber Driver
SW1
J1
J3
J4

ME320A-D24

ME320A


Industrial Fiber Driver (ME320A-D24)
Industrial Fiber Driver (ME320A)
PC or PLC
Single-Mode or Multimode Fiber
115-VAC Power
Remote Telemetry Unit or Other Controlled Device
24-VDC Connection

SPECIFICATIONS

Distance — Varies with fiber type and dB loss
Fiber Compatibility — Single-mode: 8/125 µ; Multimode: 50-µ to 200-µ core
Fiber Input Sensitivity — 1 µW
Fiber Output Power — 100 µW
Speed — Serial: 115.2 Kbps; Parallel: 230 KBps in nibble mode
Wavelength — 820 µW
CE Approval — ME310A-D24, ME310A-D48, ME315A-D24, ME315A-D48, ME320A-D24, ME320A-D48, and 230-VAC versions: ME310AE, ME315AE, ME320AE
Interface — RS-232, Centronics parallel, 2- or 4-wire RS-485
Connectors — Fiber: (2) ST®; RS-232: DB25 female; RS-485: DB9 female; Parallel: DB25 female (PC standard pinout)
Power — ME310A, ME315A, ME320A: 115 VAC (230-VAC version on request); ME310A-D24, 315-D24, 320-D24: 24 VDC; ME310A-D48, 315-D48, 320-D48: 48 VDC; 250-mA maximum
Size — AC: 1"H x 2.3"W x 3.7"D (2.5 x 5.8 x 9.4 cm); DC: 2.3"H x 5"W x 5"D (5.8 x 12.7 x 12.7 cm)
Weight — 1.4 lb. (0.6 kg) with power supply

Item	**Code**	**Price**
Industrial Fiber Drivers		
RS-232↔Fiber		
AC	ME320A	**$385.00**
24-VDC	ME320A-D24	**$485.00**
48-VDC	ME320A-D48	**$485.00**
Centronics↔Fiber		
AC	ME315A	**$370.00**
24-VDC	ME315A-D24	**$470.00**
48-VDC	ME315A-D48	**$470.00**
RS-485↔Fiber		
AC	ME310A	**$370.00**
24-VDC	ME310A-D24	**$470.00**
48-VDC	ME310A-D48	**$470.00**

Synchronous Fiber Optic Modem

Send Sync RS-232 Data 2 Miles over Fiber—up to 19.2 Kbps.

- **Draws power from the RS-232 interface.**
- **Clocking ensures correct delivery of data.**
- **Gives you all the security of fiber optics.**
- **Ideal for IBM® controllers and terminals.**

This nonpowered modem plugs into the RS-232 interface. Internal, external, or loopback clocking ensures correct delivery of your data. And you can set the Carrier to transfer one control signal end to end.

SPECIFICATIONS

Clocking — Internal, external, or loopback
Distance — 2 mi. (3.2 km)
Operation — Half- or full-duplex
Protocol — Synchronous
CE Approval — All items listed are approved
Interface — RS-232
Connectors — (1) DB25, (2) SMA or (2) ST®
Power — From the interface

Item		**Code**	**Price**
Synchronous Fiber Optic Modem			
SMA	Male	MD630A-M	**$285.00**
	Female	MD630A-F	**$285.00**
ST	Male	MD630A-MST	**$285.00**
	Female	MD630A-FST	**$285.00**

Async Fiber Optic Modem

Connect Async Equipment over Duplex Fiber—No AC Power Required!

- **Sends your sync data 2 miles (3.2 km) at 19.2 Kbps.**
- **Draws power right from the RS-232 interface.**

The Async Fiber Optic Modem is your easy-to-use, inexpensive solution for connecting async equipment over fiber cable. Just plug the Modem into the DB25 port of your asynchronous devices, then attach fiberoptic cable to the ST® or SMA connectors. Your data will move along smoothly!

This Modem features a switch-selectable DTE or DCE option. It can operate as a DTE in order to connect to another DCE, and you don't have to buy extra cross-cable. You can also set the carrier so that the RTS switch controls transfer of one control signal, end to end.

SPECIFICATIONS

Distance — 2 mi. (3.2 km)
Operation — Half- or full-duplex
Protocol — Asynchronous
Speed — 19.2 Kbps
CE Approval — All items listed are approved
Interface — RS-232
Connectors — (1) DB25 and (2) SMA or (2) ST
Power — From the interface

FOM-6A
ME600A

Item		**Code**	**Price**
Async Fiber Optic Modem			
ST	Male	ME600A-MST	**$165.00**
	Female	ME600A-FST	**$165.00**
SMA	Male	ME600A-M	**$165.00**
	Female	ME600A-F	**$165.00**

More Solutions for Your Industrial Networking Applications!

Take *total command* of your programmable logic controllers and remote telemetry units.

Slash maintenance costs, boost service levels, and aid in regulatory compliance!

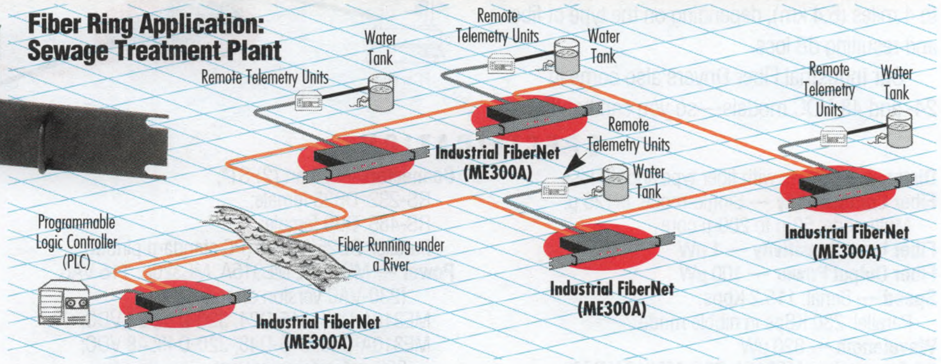
Excellent for heavy industries, utilities, agriculture, and scientific field research.

Industrial FiberNet

BLACK BOX
(412) 746-5500
POWER
MAIN
IN OUT
REPEATER
IN OUT
Industrial FiberNet

- Extends 2- and 4-wire RS-485 or RS-422 data over fiber.
- Repeater port replicates data, making it easy to assemble a ring network of industrial RS-485 devices.
- Active signal regeneration eliminates signal distortion—add as many nodes as you want!
- Repeater and automatic direction control ensure clean, accurate transmissions.
- Reliable! If failure occurs, the network's designated Master Fiber-Net transmits into its main and repeater ports, driving the signal both ways!
- Overcome distance limitations in multifloor settings! Plus get electrical isolation for multi-building networks and noise immunity in manufacturing facilities.

Fiber Ring Application: Sewage Treatment Plant


Remote Telemetry Units
Water Tank
Remote Telemetry Units
Water Tank
Remote Telemetry Units
Water Tank
Remote Telemetry Units
Water Tank
Industrial FiberNet (ME300A)
Industrial FiberNet (ME300A)
Industrial FiberNet (ME300A)
Industrial FiberNet (ME300A)
Programmable Logic Controller (PLC)
Fiber Running under a River

SPECIFICATIONS

Distance — Varies with fiber type and dB loss
Fiber Compatibility — Single-mode: 8/125 µ; Multimode: 50-µ to 200-µ core
Fiber Input Sensitivity — 1 µW
Fiber Output Power — 100 µW
Wavelength — 820 µW
CE Approval — ME300A-D24 and 230-VAC version: ME300AE
Interface — 2- and 4-wire RS-485, RS-422
Connectors — (1) DB9 female, (4) ST®
Power — 115 VAC, 60 Hz, 500-mA maximum; 24 VDC, 500-mA maximum (230-VAC, 50-Hz version on request)
Size — 1.8"H x 19"W x 8"D (4.6 x 48.3 x 20.3 cm)

FAXBACK INFORMATION
Request Document Number: 17501
Call 412-746-5500 Anytime

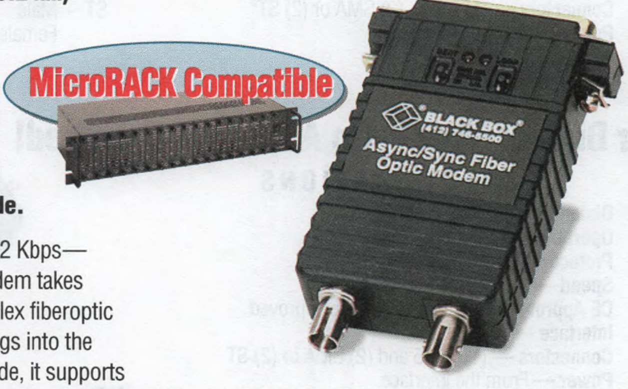
Item	Code	Price
Industrial FiberNet		
115-VAC	ME300A	**$1395.00**
24-VDC	ME300A-D24	**$1395.00**
remember to order cables: DB9 Extension Cable, 10-ft. (3.0-m) Male/Female	EDN12H-0010-MF	**$22.95**

For other lengths, see p. 105.

Async/Sync Fiber Optic Modem

Your Async or Sync Data Goes up to 2 Miles at 19.2 Kbps over Fiber.

- **Sends your sync data 2 miles (3.2 km) at 19.2 Kbps.**
- **Draws power from the RS-232 interface.**
- **V.54 loopback and V.52 BERT pattern generator.**
- **Internal, external, or receive loopback clocking in Sync Mode.**


MicroRACK Compatible
BLACK BOX
(412) 746-5500
Async/Sync Fiber Optic Modem

You set the data rate—up to 19.2 Kbps—and the Async/Sync Fiber Optic Modem takes your data 2 miles (3.2 km) over duplex fiberoptic cable. This nonpowered modem plugs into the RS-232 interface. While in Sync Mode, it supports three clocking methods—internal, external, or loopback—to ensure the correct delivery of your data. And you can set carrier options to "Continuously On" or "Controlled by RTS."

FAXBACK INFORMATION
Request Document Number: 13734
Call 412-746-5500 Anytime

SPECIFICATIONS

Diagnostics — V.54 loopback and V.52 BERT
Operation — Half- or full-duplex
Protocol — Asynchronous and synchronous
CE Approval — All items listed are approved
Interface — RS-232
Power — From the interface

Item		Code	Price
Async/Sync Fiber Optic Modem Standalone (DB25 Connector)			
ST®	Male	ME570A-MST	**$295.00**
	Female	ME570A-FST	**$295.00**
SMA	Male	ME570A-MSM	**$295.00**
	Female	ME570A-FSM	**$295.00**
Async/Sync Fiber Optic Modem Card (HD DB26 Connector)			
ST	Female	ME570C-ST	**$279.00**
SMA	Female	ME570C-SM	**$279.00**

remember to order cables ***You will need to order one of these cables for each card you order:***

Item	Code	Price
HD DB26 to DB25M	EHN088-0006	**$59.55**
HD DB26 to DB25F	EHN089-0006	**$59.55**

Fiber Optic Multipoint Line Driver

Run Multipoint through Industrial Settings—with This Fiber Driver.

- **Supports RS-232, RS-485, or current-loop installations.**
- **Speeds as high as 128 Kbps.**
- **Ideal for electrically "noisy" industrial applications.**
- **Provides centralized control of a multipoint polled system from just one PC.**

> ***"Your Fiber Line Drivers were the cost-effective way to extend the RS-485 communications of our plant."***

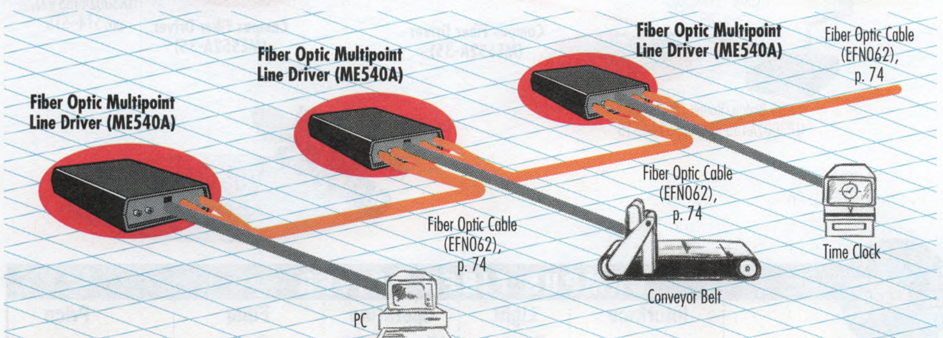
232
485
20mA
NETWORK
MASTER
SLAVE
TXD
RXD
TXD
RXD
INTERFACE
MODE
PORT B
PORT A
FOM LINE DRIVER
NORMAL
DLB
BLACK BOX

Fiberoptic cable is immune to the EMI and RFI generated by heavy-duty motors and industrial machinery. And that's why this Multipoint Line Driver is the *perfect choice* for data communications in even the harshest industrial settings.

Connect RS-232, RS-485, or current-loop devices with the BLACK BOX® Fiber Optic Multipoint Line Driver. Then you can monitor and control any number of industrial devices—time clocks, conveyor belts, even printers and controllers—all from one central site. Using the inherent benefits of fiberoptic cable, you can completely automate your factory operations—just call Black Box!

You'll enjoy increased data speeds, too—up to 20 Kbps for current-loop data, 64 Kbps for RS-232, and 128 Kbps for RS-485 data. And, of course, fiberoptic cable eliminates the threat of power surges and the need for surge-protection equipment.

NOTE: Must be used in pairs.


Fiber Optic Multipoint Line Driver (ME540A)
Fiber Optic Multipoint Line Driver (ME540A)
Fiber Optic Multipoint Line Driver (ME540A)
Fiber Optic Cable (EFN062), p. 74
Fiber Optic Cable (EFN062), p. 74
Fiber Optic Cable (EFN062), p. 74
Time Clock
Conveyor Belt
PC

SPECIFICATIONS

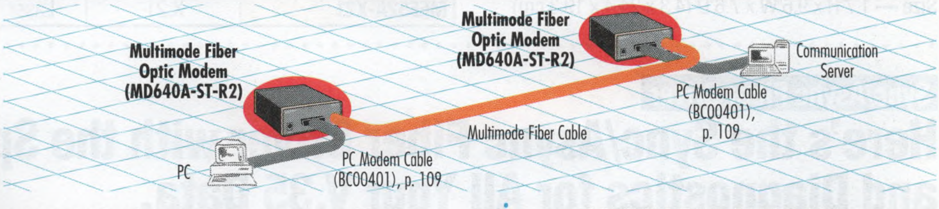
Maximum Distance — 5000 ft.
Operation — Network Mode or Master/Slave Mode, multipoint half-duplex, point-to-point line driver operation, full-duplex
Speed — Transparent through 128 Kbps
CE Approval — All items listed are approved
Interface — RS-232 DCE/DTE, RS-485, 20-mA current loop (Transmit and Receive can be active or passive), fiberoptic
Connectors — (1) DB9, (4) ST or SMA, (1) 4-screw terminal block
Power — 115 VAC, 60 Hz, external
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)
Weight — 2 lb. (0.9 kg)

Item	**Code**	**Price**
Fiber Optic Multipoint Line Driver		
ST®	ME540A-ST	**$385.00**
SMA	ME540A-SM	**$385.00**
remember to order cables DB9 Extension Cable, 10-ft. (3.0-m) Male/Female	EDN12H-0010-MF	**$22.95**
For other lengths, see p. 105.		
Bulk Duplex Fiber Optic Cable, PVC, ST-ST Custom Lengths	EFN062-CC	**$79.95 + $.70/ft.**
For specific lengths or bulk cable, see pp. 74 and 117–118.		

Multimode Fiber Optic Modem

Fiber Driving—Send Sync Data at 256 Kbps, Async up to 38.4 Kbps.

Made In The USA
Powered Fiber Optic Modem
Interface
Fiber
Power


Multimode Fiber Optic Modem (MD640A-ST-R2)
Multimode Fiber Optic Modem (MD640A-ST-R2)
Communication Server
PC Modem Cable (BC00401), p. 109
Multimode Fiber Cable
PC
PC Modem Cable (BC00401), p. 109

- **Full-duplex transmission over multimode cable. Choose ST® or SMA connectors.**
- **Sends high-speed data up to 1.5 miles.**
- **Hardware or software flow control.**
- **Internal or external clocking.**

Order a pair of our Multimode Fiber Optic Modems to send sync or async data fast—sync data at up to 256 Kbps, and async data at up to 38.4 Kbps! And at these high speeds, your data still goes 1.5 miles.

One multimode cable is all it takes for full-duplex transmission. If you've already installed duplex fiber cable (separate Transmit and Receive terminations), you're really in luck—you can use each fiber separately.

This modem also features hardware or software flow control and internal or external clocking, Tri-state front-panel LEDs make monitoring Modem performance easy. And external DIP settings mean you never have to open the case for configuration.

SPECIFICATIONS

Flow Control — Hardware or software
Operation — Full-duplex
Protocol — Synchronous or asynchronous
Speed — Sync to 256 Kbps, async to 38.4 Kbps
CE Approval — All items listed are approved
Interface — RS-232
Connectors — ST or SMA
Power — 115 VAC, 60 Hz, output 10 VAC
Size — 1.5"H x 4.1"W x 5"D (3.8 x 10.4 x 12.7 cm)
Weight — 5 lb. (2.3 kg)

Item	**Code**	**Price**
Multimode Fiber Optic Modem		
ST	MD640A-ST-R2	**$425.00**
SMA	MD640A-SMA-R2	**$425.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83.		

Campus Fiber Driver

This Fiber Driver Has the Power—Up to 2.048 Mbps! Up to 31 Miles!

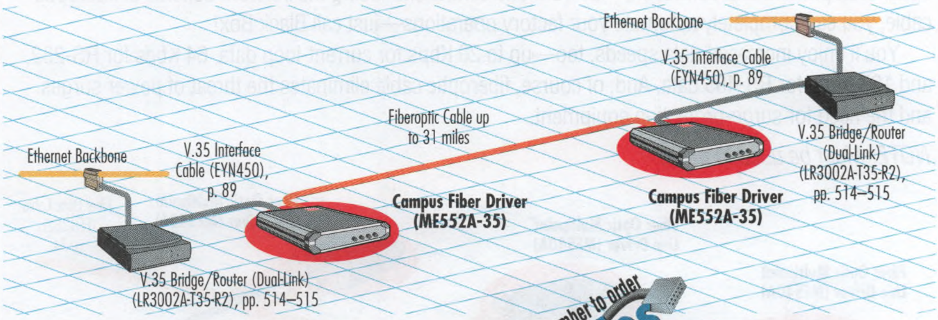
DTE
TX
RX
115VAC/ 0.2A T 250V
BLACK BOX (412) 746-5500
PWR RTS TD RD DCD TEST ERR
DIG ANA REM PATT
Campus Fiber Driver

Make high-speed connections over secure fiberoptic lines.

- **Wide range of selectable data rates: 56 Kbps to 2.048 Mbps.**
- **Laser option for extended transmission range of up to 31 miles (50 km).**

The BLACK BOX® Campus Fiber Driver is a synchronous, high-speed modem that enables communication between two V.35 or X.21 data devices over a fiberoptic link. A pair of Campus Fiber Drivers creates a secure fiberoptic link that is immune to electrical interference and differential ground loops.

The ME550A models transmit data via multimode fiber up to 3.1 miles (5.0 km). The ME551A versions transmit via single-mode up to 12.4 miles (20 km). For maximum distance, the ME552A models use a laser diode to transmit data via single-mode fiber—up to 31 miles (50 km)!


Ethernet Backbone
V.35 Interface Cable (EYN450), p. 89
V.35 Bridge/Router (Dual-Link) (LR3002A-T35-R2), pp. 514–515
Campus Fiber Driver (ME552A-35)
Fiberoptic Cable up to 31 miles
Campus Fiber Driver (ME552A-35)
V.35 Bridge/Router (Dual-Link) (LR3002A-T35-R2), pp. 514–515
V.35 Interface Cable (EYN450), p. 89
Ethernet Backbone

remember to order cables

V.35 Cables, see p. 89.

SPECIFICATIONS

Clocking — Receive: From receive signal; Transmit: Internal, External, or Loop Clock

Diagnostics — All: Digital Loopback, Remote Loopback, Local Analog Loopback, Pattern (BER); V.35 models: ITU V.54

Receiver Sensitivity — ME550A: -39 dBm; ME551A–ME552A: -40 dBm

Speed — 56, 64, 112, 128, 256, 384, 512, 768, 1024, 1536, 1544, and 2048 Kbps

Typical Output Power — ME550A–ME551A: -18 dBm: 62.5/125; ME552A: -12 dBm: 9/125

CE Approval — ME552A-35, ME552A-X21 and 230-VAC versions: ME550AE–ME551AE

Connectors — All: (2) ST®; V.35 models: (1) 34-pin D-type female; X.21 models: (1) 15-pin D-type female

Indicators — Transmit Data, Receive Data, Request to Send, Data Carrier Detect, BER test error (ERR), Power, Loopback mode or BER (TEST)

Power — 115 VAC, 60 Hz (230-VAC, 50-Hz version on request)

Size — 1.7"H x 9.6"W x 7.6"D (4.3 x 24.4 x 19.3 cm)

BUYER'S GUIDE

CAMPUS FIBER DRIVER	Interface	Light Source	Operating Wavelength	Fiber Type	Price
ME550A-35	V.35	LED	850 nm	Multimode	**$1095.00**
ME551A-35	V.35	LED	1300 nm	Single-Mode	**$2195.00**
ME552A-35	V.35	Laser	1300 nm	Single-Mode	**$2545.00**
ME550A-X21	X.21	LED	850 nm	Multimode	**$1095.00**
ME551A-X21	X.21	LED	1300 nm	Single-Mode	**$2195.00**
ME552A-X21	X.21	Laser	1300 nm	Single-Mode	**$2545.00**

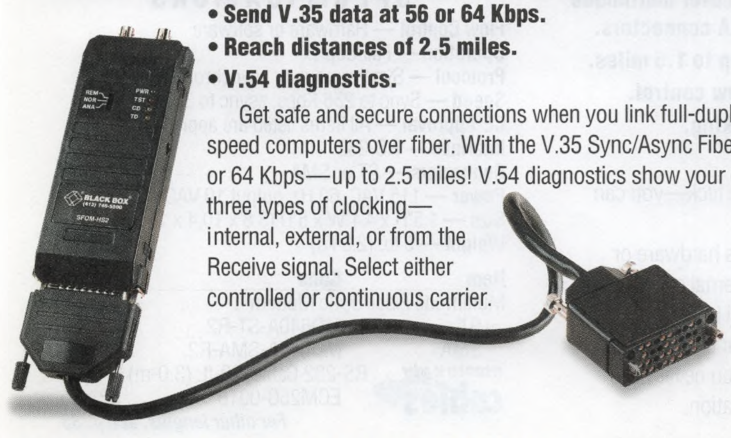
◆ ◆ ◆

Sync/Async Fiber Driver

Here's the Sync/Async Fiber Driver with the Speed, Safety, and Diagnostics for All Your V.35 Data.

- **Send V.35 data at 56 or 64 Kbps.**
- **Reach distances of 2.5 miles.**
- **V.54 diagnostics.**

Get safe and secure connections when you link full-duplex sync devices to high-speed computers over fiber. With the V.35 Sync/Async Fiber Driver, data zips at 56 or 64 Kbps—up to 2.5 miles! V.54 diagnostics show your data's status. And you get three types of clocking—internal, external, or from the Receive signal. Select either controlled or continuous carrier.


REM
NOR
ANA
PWR
TST
CD
TD
BLACK BOX
SFOM-HS2

NOTE: Use in pairs.

SPECIFICATIONS

Maximum Distance — 2.5 mi. (4 km)

Operation — Full-duplex

Protocol — Synchronous or asynchronous

Speed — 56 or 64 Kbps

Interface — V.35

Connectors — (1) 34-pin female; ST model: (2) ST®; SMA model: (2) SMA

Power — Input: 115 VAC, 60 Hz; Output: 9 VDC, 300 mA

Size — 1.2"H x 2.1"W x 5.1"D (3 x 5.3 x 13 cm)

Weight — 0.2 lb. (0.1 kg)

Item		Code	Price
Sync/Async Fiber Driver (SFOM-HS2)			
V.35	ST	MT633A-ST35	**$362.00**
	SMA	MT633A-SM35	**$362.00**

In This Section...
Modem Eliminators
RS-232/Copper
Parallel/Copper

V.35 Fiber Optic Line Driver

Watch V.35 Data Go Faster—*Farther*—over Fiber!

- **Maximum flexibility! It runs full- or half-duplex, point-to-point, or multipoint.**
- **Transmits V.35 data up to 1.4 miles at 256 Kbps—even farther at slower speeds!**

V.35 FOLD
OLB TEST
RTS CD TD RD
PWR
BLACK BOX

Get the versatility you need with this V.35 Driver: Set it for full- or half-duplex operation, use it in point-to-point or multipoint applications. Send synchronous data between a mainframe and a controller. Link two LAN bridges in the same building for high-speed networking. You can even set up a V.35 tail-circuit cable. The built-in loopback test keeps the fiber link in sync.

This flexible V.35 Line Driver will send your data at speeds up to 256 Kbps via duplex fiberoptic cable—up to 1.4 miles (2.3 km) away! It's available in two models with either ST® or SMA connectors. And you can use the RS-530 adapter cable (included) to convert the DB25 V.35 interface to a 34-pin connector, if necessary. Front-panel LEDs (TX, RX, RTS, and CD) indicate flow control at a glance. Set speed, carrier (constant or switched), operation (full- or half-duplex), and TX data clock select—all with internal switches and jumpers.

SPECIFICATIONS

Maximum Distance — 1.4 mi. (2.3 km) with 100-μ, -5 dB/km fiberoptic cable; 0.9 mi. (1.5 km) with 62.5-μ, -5 dB/km fiberoptic cable
Speed — 2400 bps to 256 Kbps
Operation — Synchronous, half- or full-duplex (switch-selectable)
Interface — V.35
Connectors — V.35: (1) DB25 female pinned RS-530; Fiber: (2) ST® or (2) SMA
Indicators — (6) LEDs: PWR, RTS, CD, TD, RD, Activity
Power — 115-VAC, 60-Hz, wallmount AC adapter
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)
Weight — 2.2 lb. (1 kg)

NOTE: Use in pairs.

Item	Code	Price
V.35 Fiber Optic Line Driver		
ST	ME522A-ST	**$495.00**
SMA	ME522A-SM	**$495.00**
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

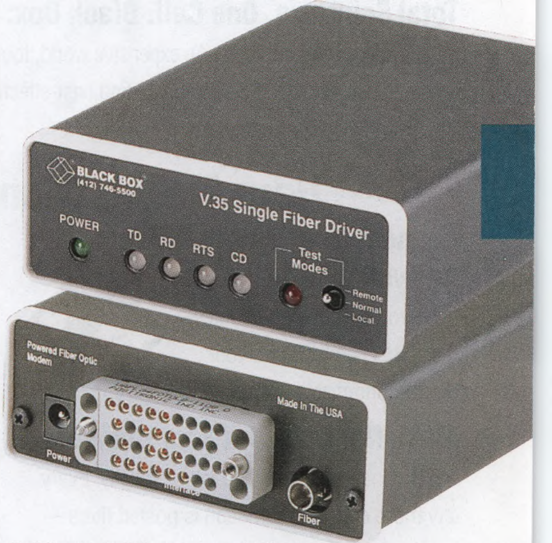
For other lengths or genders, see p. 89.

◆ ◆ ◆

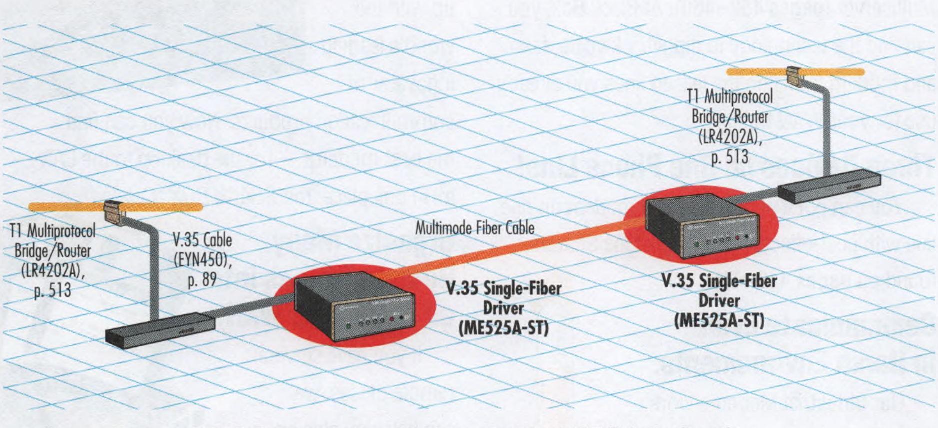
V.35 Single-Fiber Driver

Extend Campus V.35 Lines on a Single Strand of Multimode Fiber Cable!

- Don't pay for dual-strand fiber cable—this Driver uses one strand of multimode fiber for full-duplex V.35 communication.
- Synchronous data rates to 256 Kbps.
- Performs local and remote loopback tests.


BLACK BOX (412) 746-5500
V.35 Single Fiber Driver
POWER
TD RD RTS CD
Test Modes
Remote Normal Local
Powered Fiber Optic Modem
Made In The USA
Power
Interface
Fiber

Building-to-building communications, up to 256 Kbps!


T1 Multiprotocol Bridge/Router (LR4202A), p. 513
T1 Multiprotocol Bridge/Router (LR4202A), p. 513
V.35 Cable (EYN450), p. 89
Multimode Fiber Cable
V.35 Single-Fiber Driver (ME525A-ST)
V.35 Single-Fiber Driver (ME525A-ST)

NOTE: For proper connections, use the V.35 Drivers in pairs.

SPECIFICATIONS

Clocking — Internal, external, received-loop in synchronous mode
Distance — 1.5 miles (2.4 km) at 256 Kbps; 3 miles (4.8 km) at 64 Kbps
Speed — Sync: 2.4 to 256 Kbps
CE Approval — All items listed are approved
Connectors — (1) M34 Female; (1) SMA or (1) ST
Power — Wallmount power supply; 115 VAC, 60 Hz
Size — 3.8"H x 2.1"W x 0.8"H (9.7 x 5.3 x 2 cm)
Weight — 1 lb. (0.5 kg)

FAXBACK INFORMATION
Request Document Number: 15956
Call 412-746-5500 Anytime

Item	Code	Price
V.35 Single-Fiber Driver		
ST	ME525A-ST	**$695.00**
SMA	ME525A-SMA	**$695.00**
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

For other lengths or genders, see p. 89.

Black Box Connects the World of Remote Communications.

Total Solutions. One Call. Black Box: 412-746-5500.

It's a big world out there. An expensive world, too, if you have to communicate around it. How can you find cost-effective solutions for *your* worldwide communications?

Black Box Technical Support Specialists Can Help You.

The Black Box Technical Support Team knows global communications better than anyone else. They can help you choose the best and most cost-effective ways to handle your communications needs.

Here Are Just Some of Black Box's Communications Solutions:

Connect to a Remote Office Anywhere in the World!

If you have a branch office, Black Box can help find your most economical connection.

Make Net Gains for Your Business.

The Internet is growing exponentially. Every day more critical information is posted there—but if you can't get to it, you can't use it. You need the *fastest* dialup modem you can buy: See the Sportster™ 56K Modem on **page 399**. And for business connections to the Net, check out the Courier™ V.Everything™ 56K Modem on **page 400**.

U.S. Robotics

Free Phone and Fax!

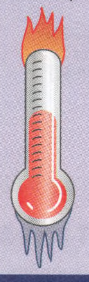
You get them when you install a Black Box Multiserver (**pages 452–460**). At Black Box, you can find the technology to piggyback voice, fax, and modem traffic on the leased lines you already use for your WAN traffic.

Three Devices on One Phone Line!

You can put a phone, fax, and modem on one line with cost-effective Black Box Line Sharers, found on **pages 412–415**.

Communicate Even in Harsh Environments.

Our Industrial Modems work under extreme conditions. Find out about their reliability, **pages 402–405**.



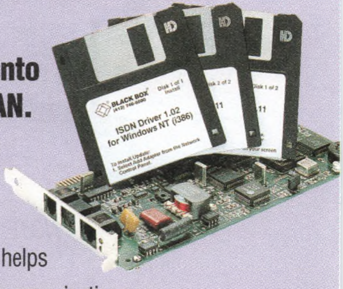
Modems by U.S. Robotics®.

We've teamed up with the world's leading innovator of communication products. Now you can find the best modems—for the desktop to the LAN—all in one place: the *BLACK BOX® Catalog!*

U.S. Robotics
TOTAL CONTROL

Organize Many Remote Offices into an Enterprise WAN.

If you have serveral remote offices, we can help you plan an enterprise network that helps keep costs down and communications up.



MODEMS, CSU/DSUs,

BLACK BOX
SOLUTIONS

7000 Connectivity Solutions!

"I'm a graphic designer who does a ton of work at home. Do you have an x2 Modem so I can download stock-photography images into my Mac® faster? I can't find one anywhere else."

Absolutely, positively YES!

Other places, like so-called retail computer superstores, may have turned their backs on Mac® users. But not Black Box. We have the x2™ Modem Mac users have been dying for—the Sportster® Modem 56K.

Internet Solutions for Macintosh Users.

The Sportster Modem 56K by U.S. Robotics® (**page 399**) is perfect for use in small- to mid-sized businesses and in the home. It can cut download time nearly in half compared to a V.34 modem—and that means **big** savings in time and money.

If you're a home-based professional, you can quickly access corporate intranets. You can download spreadsheets and e-mail at up to a speedy 56 Kbps. *And* you can download detailed graphics, high-bandwidth audio and video streams from the Net faster than ever!

The Mac compatible Sportster can transmit data from the Macintosh® to any other fax device and print to any laser printer. And it's one incredible tool for graphics. Not only can it download at high speeds, but it also can convert received faxes to PICT, TIFF, or Paint formats for printing or importing into other documents.

For your x2 Modem solution, see **pages 394–401**.

Over 7000 Solutions and Counting!

Whether you use a PC, Sun®, *or* Mac, we have what you need. That's why we are *The World's Source for Connectivity℠*!

Looking for the solution that's right for you? Call Black Box's world-famous Technical Support at **412-746-5500**. Our experts are here 24 hours a day, 7 days a week.

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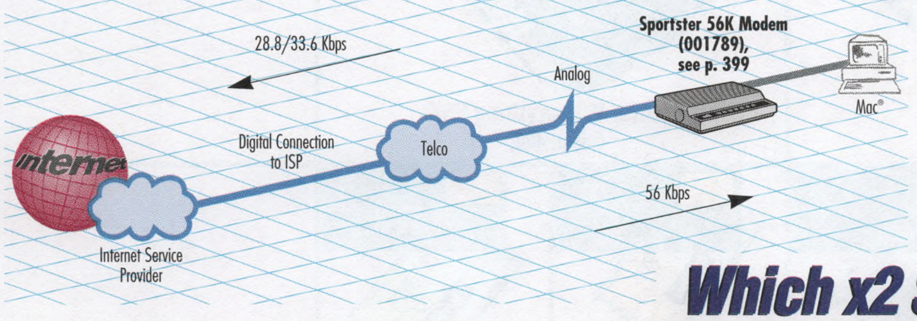
U.S. Robotics
X
TECHNOLOGY
U.S. Robotics
Sportster® Faxmodem with x2™
56k
x2


28.8/33.6 Kbps
Sportster 56K Modem (001789), see p. 399
Analog
Mac®
Internet
Digital Connection to ISP
Telco
56 Kbps
Internet Service Provider

VIPreview
Ask for our
Modems & More VIPreview.

Everything You Need for Any Application PLUS a FREE Poster-Sized Data-Transmission Guide (Modems & Line Drivers).

Which x2 Solution Is for You?

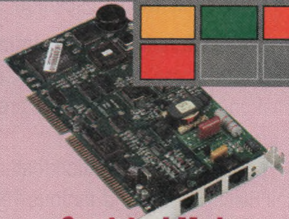
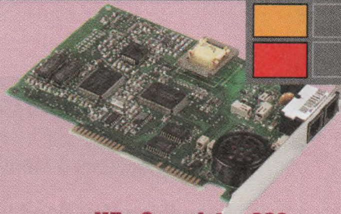
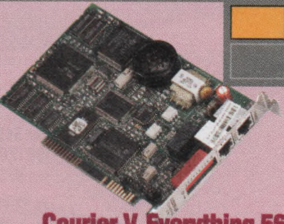
Just see the chart on the next page!

FOR *FAST* TECH SUPPORT,
Call **412-746-5500**
PRESS 1,2,3 COMMUNICATIONS
Modems, CSU/DSUs, ISDN, T1, X.25/Frame Relay, Muxes/Line Sharing, Line Drivers, Video & Multimedia, PC Communications/Accessories

Or if You Prefer:
Fax Us at: 412-746-0746.
E-mail Us at: info@blackbox.com

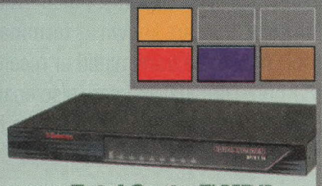
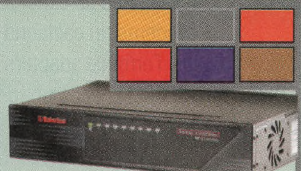
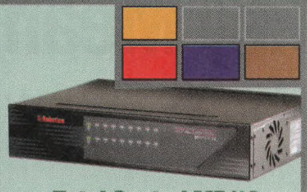
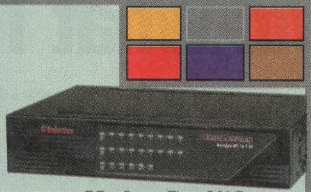
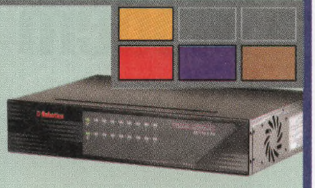
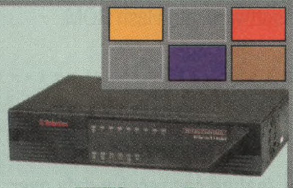
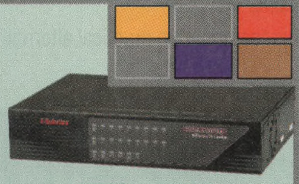
MORE!
Modems, CSU/DSUs, & Muxes
HOT NEW PRODUCTS

Single-User

PLATFORMS		Analog		ISDN
PC	External	 🟧🟥 **Sportster® 33.6** (see **p. 398**)	 🟧🟥🟪🟫 **Courier™ V.Everything** (see **p. 400**)	
		 🟧🟩 **Sportster 56K** (see **p. 399**)	 🟧🟩🟪🟫 **Courier V.Everything 56K** (see **p. 400**)	 🟧🟩🟥🟥🟪🟫 **Courier I-Modem** (see **p. 426**)
	Internal	 🟧🟥 **Speedster™ 288** (see **p. 398**)	 🟧🟩 **Sportster 56K** (see **p. 399**)	 🟧🟩🟥🟥 **Sportster I-Modem** (see our **Hot New Products**)
		 🟧🟥 **Win Speedster 288** (see **p. 398**)	 🟧🟩🟪🟫 **Courier V.Everything 56K** (see **p. 400**)	
	PC Card	 🟧 **Sportster 28.8/33.6** (see **p. 399**) 🟧 **Megahertz 33.6 with Ethernet** (see **p. 399**)	 🟧 **Megahertz 33.6/Cellular** (see **p. 399**) 🟧🟩 **Megahertz 56K** (see **p. 399**)	
Mac®	External	 🟧🟩 **Sportster 56K** (see **p. 399**)	 🟧🟩🟪🟫 **Courier V.Everything 56K** (see **p. 400**)	

Multi-User

PC

	Analog	ISDN	Cellular	Managed
8-Port RS-232	 **Total Control™ MP/8 Modem Pool** (see **p. 401**)	 **Modem Pool/8 I-Modem** (see **p. 427**)		
16-Port RS-232	 **Total Control MP/16 Modem Pool** (see **p. 401**)	 **Modem Pool/16 I-Modem** (see **p. 427**)	**Total Control MP/16 Cellular Modem Pool** (see **p. 401**)	 **Total Control MP/16 Managed Modem Pool** (see **p. 401**)
8-Port Ethernet	**NETServer/8 V.34** (see **p. 539**)	 **NETServer/8 I-Modem** (see **p. 539**)		
16-Port Ethernet	**NETServer/16 V.34** (see **p. 539**)	 **NETServer/16 I-Modem** (see **p. 539**)		

Which Modem Is Right for You? It's Easy to Decide!

- First, decide if you need a Modem for one user or many users.
- Second, find the Modems for your PC or Mac®.
- Next, determine your type of phone line. We have Modems for standard analog lines, high-bandwidth ISDN lines, and cellular communications.
- Finally, choose from External, Internal, or PC Card versions. External models are small enough for your desktop, Internal models slide right into your CPU, and PC Cards plug into your laptop computer.

FEATURES LEGEND

🟧 33.6 Kbps	🟩 56 Kbps	🟥 128 Kbps
🟥 x2 Upgradable	🟪 Async & Sync	🟫 Security

x2 Features

For more details, see pages 396–397.

Black Box Explains...

Analog and ISDN Modems.

Analog modems transmit data over ordinary phone lines. Data transmitted across analog lines is represented by a continuously varying electrical signal.

ISDN modems transmit over digital lines running at 64 Kbps. Data is transmitted over either one or two 64-Kbps voice/data channels and is encoded as either a binary 1 (one) or 0 (zero). When there are ISDN modems on each end of the line, they are known as **terminal adapters**.

Terminal adapters enable data to be transmitted or received over ISDN at speeds up to 128 Kbps. Terminal adapters also enable you to connect non-ISDN equipment such as phones or PCs to ISDN.

Modem Features and What They Mean:

33.6 Kbps

33.6 Kbps

Modems with this feature can transmit and receive data over analog lines at a top speed of 33.6 Kbps.

- Modems comply with the ITU V.34+ standard.
- 33.6-Kbps U.S. Robotics® Modems can be upgraded to 56-Kbps x2™ speeds by downloading the appropriate software into Flash ROM.

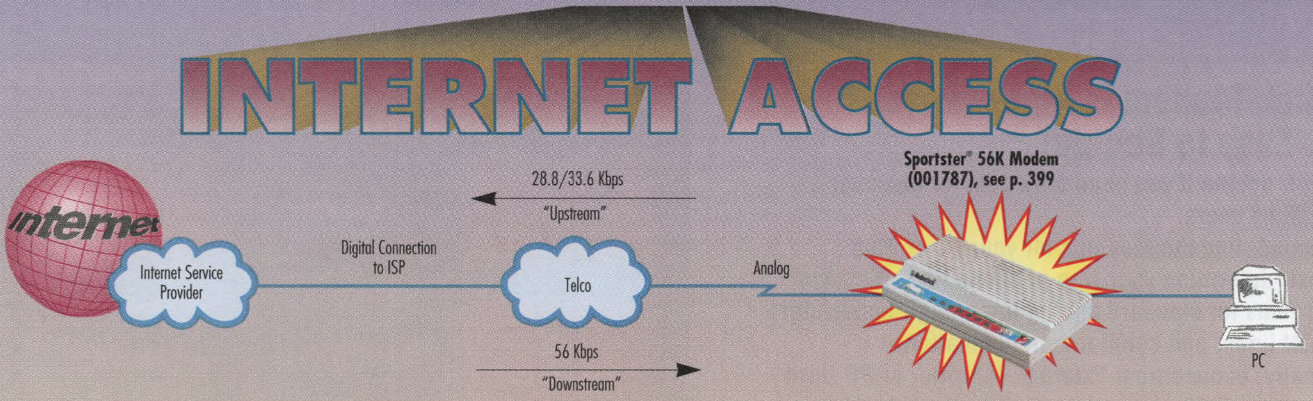
56 Kbps

56 Kbps

Modems with this feature can receive data over analog lines at a top speed of 56 Kbps.

- U.S. Robotics pioneered 56-Kbps data rates, with the innovation known as x2 Technology.
- 56-Kbps speeds are achieved via server to modem for downloads only. Top connection speeds remain at 33.6 Kbps.
- Modems with this feature are a practical alternative to ISDN when a digital line is cost-prohibitive.

What Can a *Speedy* x2 Modem Do for You?


INTERNET ACCESS
internet
Internet Service Provider
Digital Connection to ISP
28.8/33.6 Kbps
"Upstream"
Telco
56 Kbps
"Downstream"
Analog
Sportster® 56K Modem (001787), see p. 399
PC

Make Quick Use of the Internet—and Save Money!

The Internet: It means many things to many people. But the one thing it means to everyone is *worldwide access* to a wealth of information. Use it to your advantage, ***faster than ever before.***

x2 Modems by U.S. Robotics enable you to get the data, the detailed graphics, the high-bandwidth audio you want—at up to a *blazing* 56 Kbps. That's nearly ***twice as fast*** as a V.34+ modem! Make quick use of the Internet—and lower your connect charges.

128 Kbps

Modems with this feature operate over ISDN lines configured for Basic Rate Interface service. With an ISDN modem at the other end of the connection, you can transmit or receive data at up to 128 Kbps.

- Basic Rate Interface (BRI) is the most commonly used and least expensive of all ISDN lines. A single BRI line combines two 64-Kbps data/voice channels plus a 16-Kbps channel for control signals. With a single ISDN line, you can talk and send data at the same time.
- When there is more data to transmit than a single 64-Kbps channel can handle, both 64-Kbps channels are linked into a single logical circuit that can support data rates up to 128 Kbps. This procedure is known as BONDING.

128 Kbps

◆ ◆ ◆

x2 Upgradable

Modems with this feature can boost download speeds from 33.6 to 56 Kbps.

- Modems can download x2™ Technology software into Flash ROM.
- Flash ROM upgrades save users the cost of buying new Modems for the latest standards and protocols.

x2 Upgradable

◆ ◆ ◆

Async & Sync

Modems with this feature can communicate with async or sync systems.

- PCs and minicomputers communicate asynchronously.
- Network routers and IBM® mainframes communicate synchronously.

Async & Sync

◆ ◆ ◆

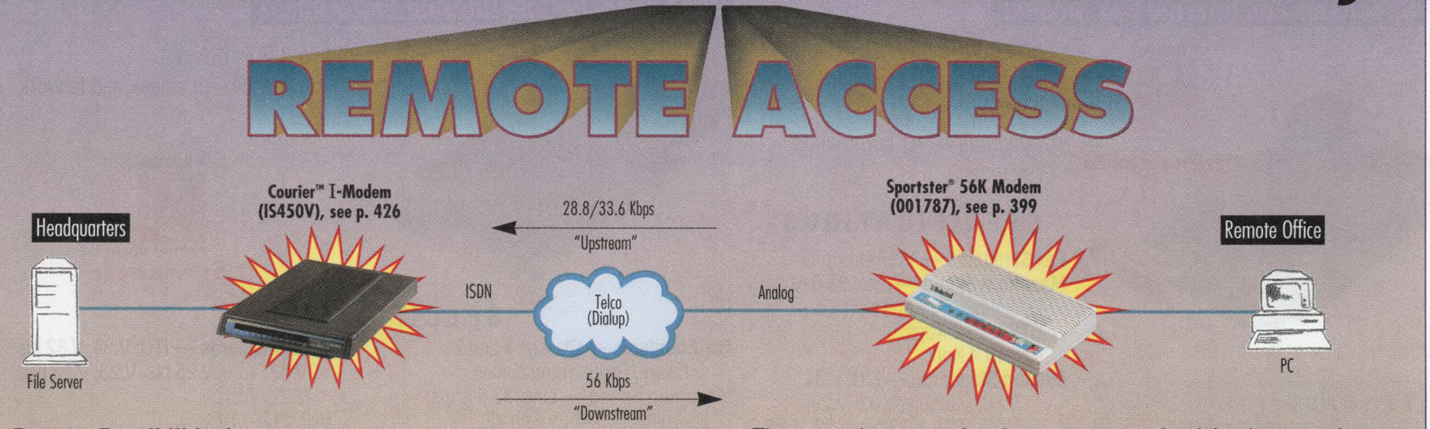
Security

Modems with this feature come with the following protection to enhance operation:

- Password Security to thwart unauthorized access to your data.
- Dialback Security to prevent unauthorized access to your system.

Security

Hint: Quick Downloads Save Time and Money!



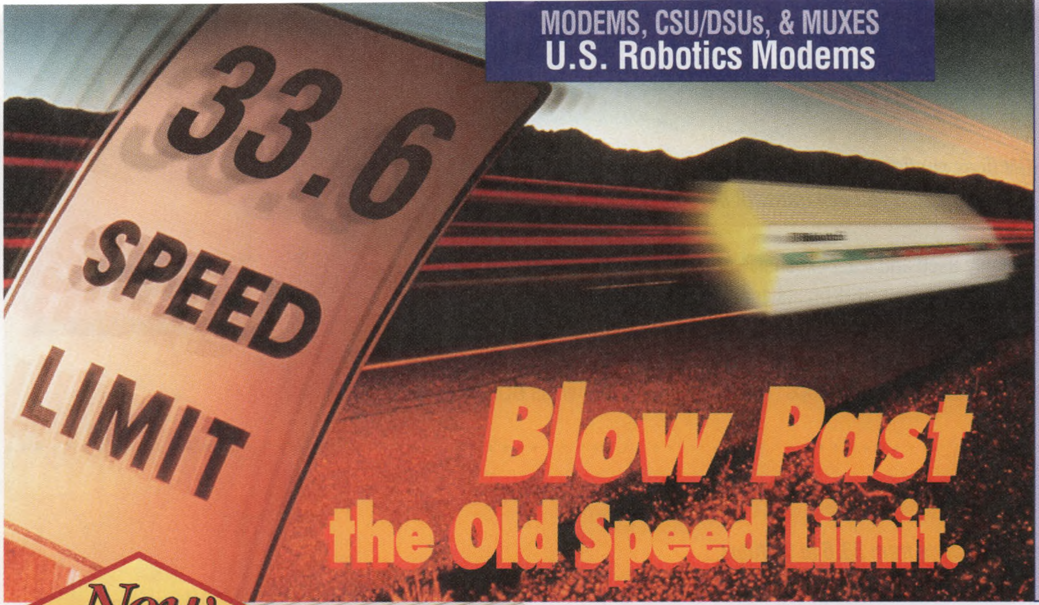
Remote Possibilities!

Want to access office files from a remote location? Want to link a remote office to headquarters? Now you can with x2 Modems!

Rapid 56-Kbps downloads save you time—and money. How?

Time saved can translate into greater productivity, increased sales, quicker problem resolutions, better customer service, and an overall competitive advantage.

Save time, save money. Think of the possibilities!


33.6
SPEED LIMIT
Blow Past the Old Speed Limit.

More than 500 U.S. and Canadian Internet Providers Support x2™ Technology, Including:

- America Online®
- CompuServe®
- IBM® Global Services
- Netcom
- Prodigy Internet
- Web America Networks

Check out www.usr.com/x2 for the latest list!

New
USRobotics
Sportster 33.6 Faxmodem

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!

FAXBACK INFORMATION
Request Document Number: 18959
Call 412-746-5500 Anytime

Sportster 33.6 Modem

Upgradable

- **Upgrade to x2 via Flash ROM.**
- **Includes CD-ROM software.**

Black Box now carries the world's best-selling 33.6-Kbps desktop modem, the **Sportster® 33.6** (000839-0) by U.S. Robotics®.

Work the Web over regular analog phone lines at 33.6 Kbps—or download up to 56 Kbps with an x2™ upgrade! The Sportster 33.6 features convenient front-panel LEDs for at-a-glance status checks. And it comes with the *Connections*™ CD-ROM, a collection of fax and Internet access software, multimedia demonstrations, plus product and support information.

For the most reliable links, order the **Sportster Ready Pak**. It includes a 10-foot Serial Cable (BC00302) and a DB9/DB25 Adapter (FA521A). You're ready to hit the Info Highway as soon as the Sportster comes out of the box!

SPECIFICATIONS

Fax Standards — V.17 Group III
Maximum Speed — Line: 33.6 Kbps; Download: 56 Kbps with x2; DTE: 115.2 Kbps; Fax: 14.4 Kbps
Modem Standards — ITU-T: V.34, V.32 bis, V.32, V.22 bis, V.22, V.21; Bell: 212A, 103
Operation — Asynchronous
Interface — RS-232
Connectors — (1) DB25 female, (2) RJ-11 female
Power — 115 VAC, 50 Hz
Size — 1.5"H x 6.5"W x 3.8"D (3.8 x 16.5 x 9.7 cm)

Item	Code	Price
Sportster 33.6 Modem	000839-0	**$169.95**
Sportster Ready Pak Includes: the Sportster 33.6 **plus (1)** Serial Cable **and (1)** DB9/DB25 Adapter	000839-0-CABPAK	**$179.95**

◆ ◆ ◆

Speedster 288 Internal Fax Modem

Upgradable

- Plugs into your PC's ISA slot.
- Compatible with all major operating systems.
- Configures via AT commands.
- Easy to use.

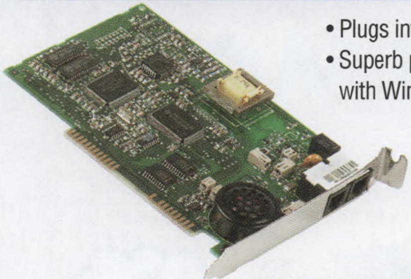
SPECIFICATIONS

Fax Standards — V.17 Group III
Maximum Speed — Line: 33.6 Kbps; Download: 56 Kbps with x2; DTE: 115.2 Kbps; Fax: 14.4 Kbps
Modem Standards — ITU: V.34, V.FC, V.32 bis, V.32, V.29, V.27, V.23, V.22 bis, V.22, V.21; Bell: 212A, 103
Operation — Asynchronous
Interface — RS-232
Connectors — (1) DB25 female, (2) RJ-11 female
Power — 115 VAC, 50 Hz
Size — Half-card

FAXBACK INFO
Request Document Number: 17295
Call 412-746-5500 Anytime

Item	Code	Price
Speedster™ 288 Internal Fax Modem	MD361C-PC	**$129.95**

Win Speedster 288 Internal Fax Modem



- Plugs into your PC's ISA slot.
- Superb performance—it's designed to work with Windows®.

Upgradable

SPECIFICATIONS

Fax Standards — Classes 1 and 2 software, Group III machines
Maximum Speed — Line: 33.6 Kbps; Download: 56 Kbps with x2; DTE: 115.2 Kbps; Fax: 14.4 Kbps
Modem Standards — ITU: V.34, V.32 bis, V.32, V.29, V.25 bis, V.23, V.22 bis, V.22, V.21; Bell: 212A, 103
Power — 115 VAC, 50 Hz
Size — Half-card

FAXBACK INFO
Request Document Number: 17305
Call 412-746-5500 Anytime

Item	Code	Price
Win Speedster™ 288 Internal Fax Modem	MD362C-PC	**$95.95**

Speedier delivery.

Now you can cut download time nearly in half! x2™ Technology is your new vehicle to get the detailed graphics, high-bandwidth audio, and video streams you want from the Information Superhighway—at up to a speedy 56 Kbps. That's nearly twice as fast as V.34 modem's top speed!

Save beaucoup bucks and time.

You can save plenty of both, when you use x2.

Remote business sites can receive verification for purchase orders in significantly less time, and they can conduct more business, rather than waiting for information transfers.

Busy work-at-home professionals can save valuable time telecommuting. They can download spreadsheets and e-mail—and access corporate intranets faster than ever.

When x2 saves you time, you save money. How? Time saved can translate into greater productivity, increased sales, quicker problem resolutions, better customer service, and an overall competitive advantage.

Stay within the lines.

x2 uses the standard analog phone lines you have now. It's supported by over 200 worldwide online services and Internet service providers. If you've been looking for a reasonably priced alternative to ISDN, x2 is it.

Get revved up.

When you buy any 33.6-Kbps Speedster™, Sportster®, or Courier™ Modem from Black Box, you can upgrade to x2—no new hardware required. To learn how easy it is, just call us.

Revved up? Good. Because it's time to hit the highway and blow past those old speed limits.

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!

PRODUCTIVITY SOLUTION PAK NEW WAYS TO WORK! AVAILABLE, TOO!

Sportster Modem 56K

Why Wait for the Upgrade? You Can Choose Your 56-Kbps Modem NOW—for PC *or* Mac!

U.S.Robotics
Sportster Faxmodem with x2
56K

New

33.6 is fine, but 56 kicks!

Black Box carries Sportster 56K Modems in Internal and External versions for PCs. *And* we have the Macintosh® compatible version that's hard to find in so-called "supercomputer" stores.

The Internal and External versions are compatible with DOS and Windows® 95. They include fax software and an Internet connection kit.

The Mac® compatible Sportster also comes with an Internet connection kit. This high-speed modem can transmit data from the Macintosh to any other fax device and print to any laser printer. Plus it can convert received faxes to PICT, TIFF, or Paint formats for printing or importing into other documents.

The External model (001786) also comes in a Ready Pak and a Solution Pak. See **page 50** for more information.

SPECIFICATIONS

Fax Standards — V.17 Group III
Line Type — Dialup, 2-wire leased line
Maximum Speed — Connecting: Up to 33.6 Kbps; Downloading: Up to 56 Kbps; Fax: 14.4 Kbps
Modem Standards — x2 56K; ITU: V.34, V.FC, V.32 bis, V.32, V.29, V.27, V.23, V.22 bis, V.22, V.21; Bell: 212A, 103
Operation — Asynchronous
Interface — RS-232
Connectors — (1) DB25 female, (2) RJ-11 female
Power — 115 VAC, 60 Hz
Size — 1.5"H x 6.5"W x 3.8"D (3.8 x 16.5 x 9.7 cm)

FAXBACK INFORMATION
Request Document Number: 18210
Call 412-746-5500 Anytime

Item	Code	Price
Sportster 56K		
Internal	001787	**$199.95**
External	001786	**$219.95**
Mac	001789	**$219.95**
Sportster 56K Modem Ready Pak Includes: the External Modem **plus** (**1**) 6-ft. Serial Cable	001786-CABPAK	**$237.90**
Power Cruise Solution Pak Includes: the External Modem, (**1**) Back-UPS®, **and** (**1**) DB9M to DB25F Adapter	BD1050A	**$419.90**

U.S. Robotics® PC Cards

Clear, Easy, and Fast Connections from Anywhere.

33.6K PC Card Modem
U.S.Robotics

New

- Compatible with most popular notebook PCs
- Includes data/fax software for Windows®.
- Sportster 33.6 is upgradable to x2™—and Megahertz® 56K downloads twice as fast as V.34!
- Megahertz 33.6 connects to cellular phone lines. One version even connects to both cellular *and* 10BASE-T.
- Megahertz Cards also feature Digital LineGuard, which protects them from damage if plugged into a digital PBX phone line.

SPECIFICATIONS

Compatibility — PCMCIA Slot Types II and III
Fax Standards — V.17 Group III
Modem Standards — SP1336, XJ1560: ITU: V.34, V.FC, V.32 bis, V.32, V.23, V.22 bis, V.22, V.21; Bell: 212A, 103; Hayes® AT command set; XJEM3336T: ITU: V.34, V.32 bis, V.32, V.23, V.22 bis, V.22, V.21; Bell: 212A, 103; Hayes AT command set; XJ4336: ITU: V.34, V.32 bis, V.32, V.23, V.22 bis, V.22, V.21; Bell: 212A, 103; Hayes AT command set
Operation — Asynchronous
Speed — Connecting: Up to 33.6 Kbps; Downloading: SP1336, XJ1560: Up to 56 Kbps; XJEM3336T, XJ4336: Up to 33.6 Kbps; Fax: Up to 14.4 Kbps
Connectors — (1) 68-pin PCMCIA Release 2.0; internal DAA
Power — From the interface
Size — 3.4"H x 2.1"W x 0.2"D (8.6 x 5.3 x 0.5 cm)

FAXBACK INFORMATION
Request Document Number: 18241
Call 412-746-5500 Anytime

Item	Code	Price
Sportster 33.6 PC Card (x2 Upgradable)	SP1336	**$229.00**
Megahertz PC Card		
56K	XJ1560	**$269.00**
33.6 (Cellular and 10BASE-T)	XJEM3336T	**$349.00**
33.6 (Cellular with XJACK)	XJ4336	**$249.95**
Cell Cable (Motorola® MicroTAC®)	52683	**$34.95**

remember to order cables

Cell Cable connects XJ4336 Card to your cellular phone. It supports a wide variety of Motorola MicroTAC, Pioneer®, and JVC® cellular phones. Other phone cables are available—call Technical Support for more information.

BLACK BOX®+

Courier V.Everything 56K Modem

The World's Top Business Modem Now Cruises at 56 Kbps!

FIVE-YEAR
FREE
5
WARRANTY
USRobotics
COURIER
V.EVERYTHING
with V.34

New

- **Supports download speeds up to 56K.**
- **Near-ISDN speeds over analog!**
- **Backwards compatible with other modems.**
- **Security and remote-configuration features.**
- **Supports dialup and two-wire leased lines.**
- **Sync or async communications.**
- **Supports Caller ID and distinctive ring services offered by the phone company.**
- **Flash ROM-upgradable for future standards.**

The Courier™ V.Everything™ 56K is the world's best business modem. And no wonder—it's *loaded* with features. And since it's a 56-Kbps x2™ modem, you get even faster downloads from the Net or remote corporate sites!

The V.Everything 56K Modem is Plug and Play. And it supports Caller ID and distinctive-ring services offered by the phone company. In case transmissions are sent over bad lines, Adaptive Speed Leveling™ technology adjusts incoming and outgoing channel speeds to match line conditions.

Even though it can cruise at 56 Kbps, this Modem is also backwards compatible—it can match the highest speeds of other modems. And it supports all international standards and popular proprietary protocols.

You also need security for your business, too. The Courier stands ready. Its Dial or Link Security Dialback features protect both sync and async transmissions. Network administrators will also appreciate that the Modem's settings can be changed over the phone—and that saves time and reduces on-site support calls.

The Courier is smart, too. Call Detection automatically switches between data and fax calls. And its V.25 bis capabilities make for faster, easier synchronous dialing and data transfer.

FAXBACK INFORMATION
Request Document Number: 18227
Call 412-746-5500 Anytime

SPECIFICATIONS

Fax Standards — V.17 Group III
Maximum Speed — Line: 33.6 Kbps uploading; 56 Kbps downloading; Fax: 14.4 Kbps
Modem Standards — x2 56K; ITU: V.34+, V.34, V.FC, V.32 terbo, V.32 bis, V.32, V.23, V.22 bis, V.22, V.21; Bell: 212A, 103
Interface — RS-232
Connectors — (1) DB25 female, (2) RJ-11 female
Power — 115 VAC, 60 Hz
Size — 1.3"H x 6.4"W x 10.3"D (3.3 x 16.3 x 26.2 cm)

Item	USR Code	Price
Courier V.Everything 56K Modem		
External	001868-0	**$339.95**
Internal	001867-0	**$309.95**
Mac®	001869-0	**$339.95**

Courier V.Everything Modem

The Best V.34+ Business Modem!

FIVE-YEAR
FREE
5
WARRANTY
USRobotics
COURIER
V.EVERYTHING
with V.34

- **Supports the V.34+ standard—you get 33.6-Kbps speed to connect to the Net!**
- **ASL technology delivers throughput even over bad lines.**
- **x2 upgradable for 56-Kbps downloads.**
- **Flash-ROM capable. Download software upgrades to keep your modem up to date.**

Upgradable

If you're looking for a smart-priced business modem, check out the Courier V.Everything!

The Courier connects and downloads up to 33.6 Kbps. And it comes equipped with all the features of its 56-Kbps version: ASL™ technology, backwards compatibility, remote configuration, security, Call Detection, and support for sync or async communications.

Packed with all these features, the Courier can *definitely* meet the varied needs of commercial users who demand the very best. Get quick connections whether you're hooking up to the Net or remote corporate sites.

Best of all, the Courier is ready for the future. Upgrade this Modem via Flash ROM—*download* new software into it! Why buy new modems for every new protocol? The Courier has the future built right in!

Applications for the Courier:

- It can send reports of daily earnings to headquarters.
- It's the fast vehicle for the telecommuting workforce.
- It's indispensible for sales reps who need to keep in touch.
- It's the perfect match for UNIX® based client/server systems.

SPECIFICATIONS

Fax Standards — V.17, V.29, V.27 ter, Group III
Line Type — Dialup, 2-wire leased line
Maximum Speed — Line: 33.6 Kbps; Fax: 14.4 Kbps
Modem Standards — ITU: V.42 bis, V.34+, V.34, V.FC, V.32 terbo, V.32 bis, V.32, V.25 bis, V.23, V.22 bis, V.22, V.21; Bell: 212A, 103
Operation — Asynchronous, synchronous
CE Approval — Yes
Interface — RS-232
Connectors — (1) DB25 female, (2) RJ-11 female
Power — 115 VAC, 60 Hz
Size — 1.3"H x 6.4"W x 10.3"D (3.3 x 16.3 x 26.2 cm)

FAXBACK INFORMATION
Request Document Number: 17367
Call 412-746-5500 Anytime

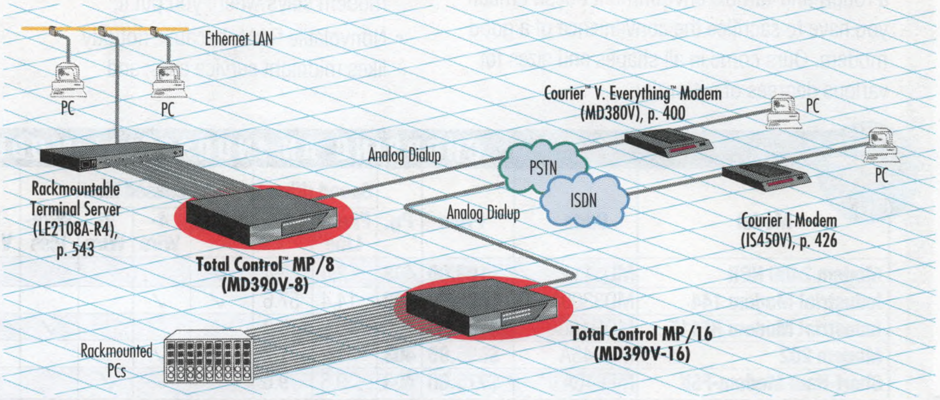
Item	Code	Price
Courier V.Everything Modem, *(USR Part #001224-0)*	MD380V	**$279.95**

USRobotics® = the best!

Total Control Modem Pools

Remote Access and Internet Access Are Easier to Manage!

- **Contain 8 or 16 V.Everything Modems.**
- **Upgradable to 56-Kbps x2 technology. Call us to find out more!**
- **Managed Version enables SNMP management of the Pool—monitor and control from any SNMP station.**
- **Cellular Modem Pool also has SNMP management and supports MNP 10 and V.42 protocols.**
- **Save money and reduce operating expenses.**


Ethernet LAN
PC
PC
Rackmountable Terminal Server (LE2108A-R4), p. 543
Total Control™ MP/8 (MD390V-8)
Analog Dialup
PSTN
ISDN
Analog Dialup
Courier™ V. Everything™ Modem (MD380V), p. 400
PC
PC
Courier I-Modem (IS450V), p. 426
Rackmounted PCs
Total Control MP/16 (MD390V-16)

Does everyone in your office have to share just one modem—a *slooow* modem—for dial-in or dial-out use? Remote access and Internet access are practically unmanageable.

Now your office can get multiple modems with excellent performance in one integrated solution—Total Control™ Modem Pools! The Modem Pools house 8 or 16 Courier™ V.Everything™ Modems that can be used on an as-needed basis, making dial-in and dial-out management *easy*.

All models come with an internal power supply and telco and DTE interfaces. Messy cabling and overheating problems associated with non-integrated modem banks are eliminated. For basic management of your modem resources, choose either the MP/8 or MP/16.

For *complete* remote-management capability at corporate branch offices and mid-sized businesses, choose the MP/16 Managed Version. Its optional TCM-lite software is easy to use and it enables network administrators to monitor and configure modems remotely, run diagnostics, download software, and perform software or hardware resets. It also displays realtime data on a GUI interface and sets alarms.

For support of MNP® 10 and V.42 protocols, choose the MP/16 Cellular Version. It also has SNMP management.

All Modem Pools are upgradable to 56-Kbps x2™ Technology—call us for more information!

FIVE-YEAR FREE 5 WARRANTY

USRobotics X TECHNOLOGY

Upgradable

SPECIFICATIONS

Fax Compatibility — V.17; EIA/TIA 578 Class 1 and EIA/TIA 592 Class 2

Maximum Speed — Line: 33.6 Kbps; Fax: 14.4 Kbps

Modem Standards — ITU: V.34, V.FC, V.32 terbo, V.32 bis, V.32, V.23, V.22 bis, V.22, V.21; Bell: 212A, 103

CE Approval — All items listed are approved

Interface — RS-232

Connectors — MD390V-8: DTE: (8) RJ-45, Line: (8) RJ-11;
MD390V-16, MD394V-16: DTE: (16) RJ-45, Line: (16) RJ-11;
MD395V-16: DTE: (16) RJ-45, Line: (16) RJ-11, Ethernet: (1) AUI, (1) RJ-45, (1) RJ-45 console port

Power — 115 VAC, 60 Hz

Size — 3.5"H x 17.5"W x 12.6"D (8.9 x 44.5 x 32 cm)

FAXBACK INFORMATION
Request Document Number: 17879
Call 412-746-5500 Anytime

Capabilities of the Managed Modem Pools:

Group Configuration—Configure all modems simultaneously.
Remote Configuration—Configure modems from any SNMP management station on the LAN/WAN.
Multiple MP Configuration—Duplicate settings for a Managed Modem Pool to any number of units.
Check Diagnostics—View call statistics in real time, receive alarm reporting, note event logging.
You Also Get—Link Security. And you can download software, too.

USRobotics
TOTAL CONTROL
MP/16 V.34

Item	Code	Price
Total Control™ Modem Pools		
MP/8, *(USR Part #000938-0)*	MD390V-8	**$3095.00** NEW LOW PRICE!
MP/16, *(USR Part #000939-0)*	MD390V-16	**$6095.00** NEW LOW PRICE!
MP/16 (Cellular), *(USR Part #01268-0)*	MD394V-16	**$7995.00** NEW LOW PRICE!
MP/16 (Managed), *(USR Part #001685-0)*	MD395V-16	**$6995.00** NEW LOW PRICE!
You may also need the following...		
Modular Adapters		
DB9F/RJ-45	FA300	**$8.95**
DB25F/RJ-45	FA305	**$8.95**
DB25M/RJ-45	FA306	**$8.95**
RJ-45 (8-wire) Modular Cable, 7-ft. (2.1-m), Straight-Pinned	EL08MS-07	**$4.95**

remember to order cables

For other lengths and pinnings, see p. 71.

• INDUSTRIAL MODEMS • INDUSTRIAL MODEMS • INDUSTRIAL MODEMS • INDUSTRIAL MODEMS • INDUSTRIAL MODEMS • INDUSTRIAL MODEMS •

BLACK BOX® Industrial Modems Have the Right Stuff!

Why choose BLACK BOX® Industrial Modems?

Because not all datacomm environments are created equal, that's why. Not all modems shuttle data in air-conditioned, climate-controlled comfort. But just because you work in a rough-and-tumble environment doesn't mean you have to sacrifice the convenience of a good modem. Ours come in all shapes and sizes for various degrees of extremity.

You'll find BLACK BOX® Industrial Modems with:

- Tough metal housings to reduce electromagnetic interference;
- Steel bolt-mount flanges—so your modem stays where you put it;
- Nonvolatile RAM, because nobody likes midnight service calls; and
- Your choice of styles, with options to fit any tough environment.

Use the chart below to spot the best Industrial Modem—*fast!*

But if you have any questions, call the experts at BLACK BOX® Technical Support. They're available 24 hours a day to help you find the right modem for your tough environment.

BUYER'S GUIDE

CHOOSING AN INDUSTRIAL MODEM

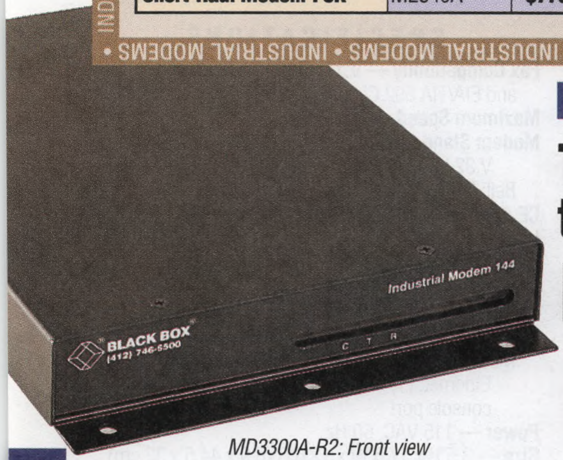
Model	Code	Price	Pg.	Speed (Kbps)		Dialup	Leased Line		Wire-less	V.42/ V.42 bis	V.22 bis	V.32	V.32 bis	Bell 202	FSK	Power
				Phone Line	DTE		4-Wire	2-Wire								
Modem 2400 NPR	MD111A	**$199.00**	**403**	2.4	2.4	✓					✓					Interface
Industrial Modem 144	MD3300A-R2	**$695.00**	**402**	14.4	57.6	✓	✓			✓	✓	✓	✓			AC/DC
Industrial Modem RF115	MDR100A	**$1795.00**	**405**	115.2	115.2				✓							AC/DC
Modem 202	MD845A	**$695.95**	**403**	1.2	1.2	✓	✓							✓		AC/DC
Short-Haul Modem-FSK	ME840A	**$775.00**	**403**	9.6	9.6			✓							✓	AC/DC

• INDUSTRIAL MODEMS • INDUSTRIAL MODEMS • INDUSTRIAL MODEMS • INDUSTRIAL MODEMS • INDUSTRIAL MODEMS • INDUSTRIAL MODEMS •

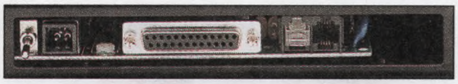
Industrial Modem 144

This Rugged 14.4 Dialup Modem Is Engineered to Operate Where Other Modems Can't!

INDUSTRIAL MODEMS FOR EXTREME APPLICATIONS



MD3300A-R2: Front view



MD3300A-R2: Rear view

MORE! Industrial Modems HOT NEW PRODUCTS

- **Durable metal enclosure wards off signal-disrupting EMI/RFI signals.**
- **V.32 bis trellis encoding, error correction, and data compression support throughput rates up to 57.6 Kbps.**
- **Operates via dialup or leased phone lines. Or use it hard-wired as a point-to-point line driver.**
- **Steel bolt-mount flange anchors the modem for use in rough industrial settings.**

Sure there are plenty of reliable 14.4-Kbps dialup modems. But they're not built to endure abusive extremes of environment and signal interference. The BLACK BOX® Industrial Modem 144 *is.*

Its durable design supports vital communications in otherwise intolerable applications. Fluorescent lights, elevator motors, nearby generators, air-conditioning compressors—all emit electromagnetic interference. But the Industrial Modem 144 endures all—even temperatures from -10° to +60° Celsius. It's the smart choice when other modems just won't stand up to the environment.

It's perfect for use in remote process-control or data-acquisition applications where you need a standalone device to ensure throughput. Use it to monitor activity at utility substations, military or agricultural installations, manufacturing plants—anywhere ordinary modems can't go.

It's ideal for long-distance links, too. Send data via leased or dialup lines. Or use it hard-wired as a line driver for point-to-point connections up to 20 miles (32 km) away.

Remote alarm-conditions dialing and auto connect/reconnect make it easy to manage this Modem from a central site, reducing service calls.

But for truly brutal conditions, check out our wireless Industrial Modem RF115 on **pages 404–405.**

SPECIFICATIONS

Operating Environment — -10 to +60° C
Speed — 14.4 Kbps (up to 57.6 Kbps with data compression and error correction)
Interface — RS-232 (or RS-485 2- or 4-wire with the optional RS-485 Modules)
Connectors — (1) RJ-11, (1) DB25
Power — 115-VAC, 60-Hz wallmount adapter (included)
Size — 1.4"H x 7.5"W x 11.3"D (3.6 x 19.1 x 28.7 cm)
Weight — 4.5 lb. (2 kg)

FAXBACK INFORMATION
Request Document Number: 15743
Call 412-746-5500 Anytime

Item	Code	Price
Industrial Modem 144	MD3300A-R2	**$695.00**
RS-485 Modem 144 Modules		
2-Wire	MD3315	**$125.00**
4-Wire	MD3316	**$125.00**
remember to order cables DB25 EDQ Shielded Cable, 5-ft. (1.5-m)		
Male/Male	EBN25C-0005-MM	**$32.95**
Male/Female	EBN25C-0005-MF	**$32.95**

Short-Haul Modem-FSK (SHM-FSK)

Extend Communications over a Single Pair—Even in the Noisiest Environments!

New
SHM-FSK
BLACK BOX® (412) 746-5500
CD
RxD
TxD
LPBK
PWR
MASTER

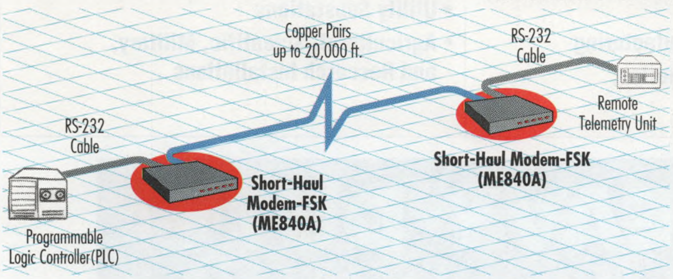
ME840A

FAXBACK INFORMATION
Request Document Number: 18966
Call 412-746-5500 Anytime

- **Frequency Shift Carrier operates above most industrial noise. Extreme tolerance to EMI/RFI interference!**
- **Totally transparent to data.**

If your industrial work environment is noisy, you can squelch the interference with the new Short-Haul Modem-FSK (ME840A).

This SHM features Frequency Shift-Key operation, which provides high immunity to noise and interference—and it's transparent to data and protocol. Adjust the SHM-FSK to changing line conditions. Modulate between 100 and 156.5 KHz to send signals above even the most harsh industrial noise. Make clean connections over a single-conductor pair.


Copper Pairs up to 20,000 ft.
RS-232 Cable
Remote Telemetry Unit
RS-232 Cable
Short-Haul Modem-FSK (ME840A)
Short-Haul Modem-FSK (ME840A)
Programmable Logic Controller(PLC)

SHM-FSK also transmits farther than most short-haul modems—up to 9.5 miles half-duplex and 3.8 miles full-duplex at 9600 bps.

Optional 2-Wire and 4-Wire Modules are available for RS-485.

- **Transmits full-duplex up to 20,000 feet at speeds up to 9600 bps.**
- **RS-485 Modules available.**
- **Point-to-point and multipoint operation.**

SPECIFICATIONS

Line Type — One twisted pair
Maximum Distance — Up to 3.8 miles (6.1 km) full-duplex over 22 AWG; 9.5 miles (15.3 km) half-duplex over 22 AWG
Maximum Speed — Up to 9600 bps
Protocol — Asynchronous
Interface — RS-232; optional RS-485 modules available
Connectors — DB25 female
Power — 115-VAC/24-VDC wall transformer supplied, 9 watts
Size — 1.3"H x 7.4"W x 11.3"D (3.3 x 18.8 x 28.7 cm)

Item		Code	Price
Short-Haul Modem-FSK		ME840A	**$775.00**
RS-485 Modules	2-Wire	MD3315	**$125.00**
	4-Wire	MD3316	**$125.00**
remember to order cables	Premium AT® Modem Cable 6-ft. (1.8-m)	EVMBMC-0006	**$17.95**

For other lengths, see p. 109.

◆ ◆ ◆

Modem 202 **The Old Reliable Modem: Bell 202.**

☎ **Bell Standard Modem**

- **Supports the hard-to-find Bell 202 dialup modem standard.**
- ***Flexible*—use it as a modem *or* a line driver.**

Back in the days of the keypunch machine, Bell 202 was *THE* top-speed modem standard, boasting data rates up to 1200 bps—four times as fast as the old Bell 108 modems.

Data communicators relied heavily on this hot new standard, and Bell 202 modems were quickly snatched up and installed throughout the country. In fact, many departments of the U.S. Government *still* rely heavily on Bell 202 modems for daily commerce. And support for the standard is still a prerequisite for many leased-line applications.

CARRIER
DATA OUT
POWER
DATA IN
CARRIER
POWER
DATA
BLACK BOX
Modem 202T

Manufactured to today's exacting specifications, these all-new "oldies" support voice-band FSK simplex or half-duplex operation at speeds up to 1200 bps on two-wire lines; or full-duplex operation up to 1200 bps on four-wire lines—all over nonswitched leased lines.

You can even use a pair of them as line drivers for links up to 20 miles over your own twisted-pair lines.

You Asked for It!

SPECIFICATIONS

Speed — Up to 1200 bps
Interface — RS-232 Async
Connectors — (1) DB9, (1) 4-screw terminal block
Power — 120-VAC, 9-watt, wallmount transformer
Size — 2.8"H x 5.5"W x 0.8"D (7.1 x 14 x 2 cm)
Weight — <1 lb. (<0.2 kg)

FAXBACK INFORMATION
Request Document Number: 16407
Call 412-746-5500 Anytime

Item	Code	Price
Modem 202	MD845A	**$695.95**

◆ ◆ ◆

Modem 2400 NPR **Little, Tough, *Reliable.***

- Perfect for remote diagnostics and data analysis.
- Draws power right from the serial port. No batteries or AC adapter needed!
- Full-featured, autoanswer, auto fallback modem—for unattended operation anywhere.
- Compact. Plugs directly into any DB25 serial port.
- Supports the complete Hayes® Standard AT Command Set.
- Nonvolatile RAM stores and remembers your configuration (no need for late-night service runs).

BLACK BOX (412) 746-5500
Modem 2400 NPR

INDUSTRIAL MODEMS FOR EXTREME APPLICATIONS
+60° C
-10° C

SPECIFICATIONS

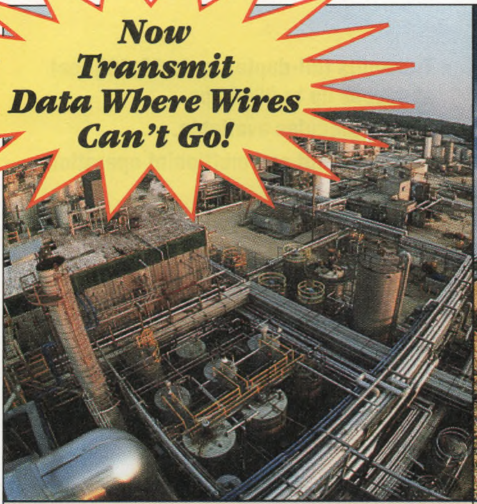
Operation — Full- or half-duplex
Speed — 300, 1200, and 2400 bps
Standards — ITU V.22, V.22 bis, Bell 103/212
Interface — RS-232
Connectors — (1) DB25 female, (1) RJ-11 female
Power — Line-powered; no battery or AC adapter required
Size — 0.8"H x 2.2"W x 3"D (2 x 5.6 x 7.6 cm)

FAXBACK INFO
Request Document Number: 14261
Call 412-746-5500 Anytime

Item	Code	Price
Modem 2400 NPR	MD111A	**$199.00**

Wireless Industrial Modems Transmit Data Securely

Now Transmit Data Where Wires Can't Go!



The modem you need when you need reliable async communications—and when dedicated lines can't get through or cost too much.

Excellent for:
- Heavy Industry and Manufacturing
- Oil and Gas Fields, Refineries, Storage Sites

- Utility Substations
- Agricultural, Scientific, Military, and Research Installations

Industrial Modem RF115

- **Makes wireless line-of-sight connections up to 20 miles (32 km).**
- **Transmits uncompressed data at speeds up to 115.2 Kbps, full-duplex.**
- **Frequency-hopping Spread Spectrum sends data error-free via radio waves.**
- **Heavy-gauge steel and industrial-grade components ward off EMI/RFI signals.**
- **Supports point-to-point or multipoint RS-232 links. Plug-in RS-485 Module also available.**
- **Nine Antenna options support a range of applications and the distances you need!**

Now there's a simple, reliable, affordable way to transmit mission-critical data where no modem has gone before. Our wireless Industrial Modem RF115 opens up a whole new world of options for establishing vital async data links in really tough environments.

> **"Our refinery installed several RF115s. Despite metal structures and other radio transmissions, your Modems always work."**

+ HEAVY-DUTY +

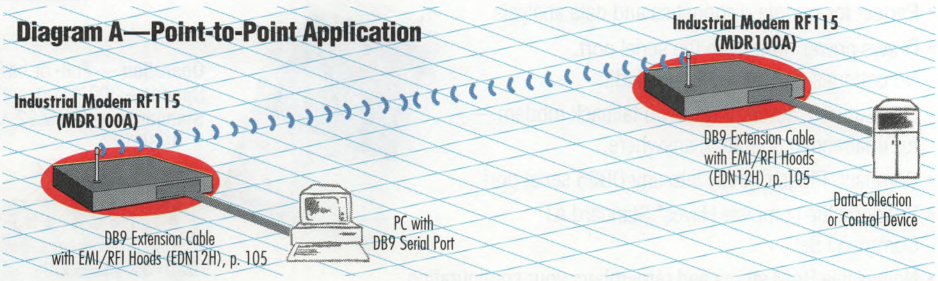
Industrial Modem RF115 uses Spread-Spectrum wireless technology to broadcast data quickly and securely where copper wires and dialup lines don't reach or cost too much to install. Electromagnetic and radio interference, industrial motors, even temperature extremes are no hazards to communication when you use Industrial Modem RF115.

Set up two Modems with your choice of the standard or optional antennas in a point-to-point configuration to connect a distant data-collection terminal, alarm unit, or remote-control device (see **Diagram A**, *below*). Or contact multiple remote devices in a polled multipoint setting. **Diagram B** (*next page*) shows an industrial application featuring a master Modem with an optional RS-485 Modem Module installed inside.

In addition to providing error-free throughput and data security, the Industrial Modem RF115 also features built-in voltage clamps and fuses to guard against damaging electrical surges on the power lines. Each Modem includes a Fixed-Whip Antenna, but can be outfitted with any of the Optional RF Antennas to support your unique application. For communication up to 20 miles (32 km), set up the Antennas in a direct line-of-sight configuration. In fact, you may be able to make obstructed-view wireless connections up to ¼ mile (0.6 km) away. We suggest you call our Tech Support experts for advice on your specific application.

For even greater flexibility, convert the DB9 RS-232 connector to RS-485 using the optional RS-485 Modem 2-Wire (MD3310) or 4-Wire (MD3311) Modules.

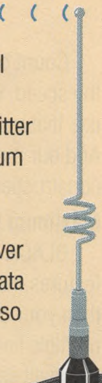
Diagram A—Point-to-Point Application


Industrial Modem RF115 (MDR100A)
Industrial Modem RF115 (MDR100A)
DB9 Extension Cable with EMI/RFI Hoods (EDN12H), p. 105
Data-Collection or Control Device
PC with DB9 Serial Port
DB9 Extension Cable with EMI/RFI Hoods (EDN12H), p. 105

through the *Harshest* Environments—up to 20 Miles!

Black Box Explains...

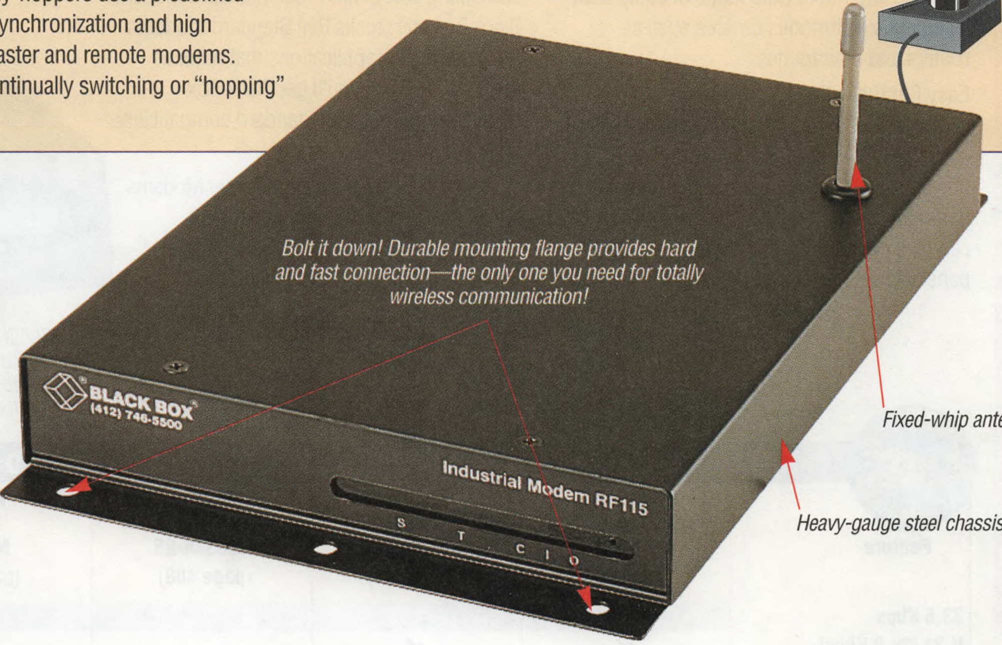
Spread Spectrum Wireless Technology.



Spread Spectrum wireless communication provides error-free transmission, top security, and high levels of throughput over the license-free 902- to 928-MHz radio band. Most radio modems on the market require an FCC site license and are based on technologies that don't work in interference-prone applications or extreme temperatures. Our spread-spectrum wireless modems are designed to endure the extremes and still provide the performance you'd expect from a hard-wired modem operating under optimal conditions. The key to this outstanding performance is a frequency-hopping transceiver.

Narrow-band frequency-hoppers use a predefined algorithm to maintain synchronization and high throughput between master and remote modems. They achieve this by continually switching or "hopping" from one transmission frequency to another. Since EMI/RFI interference rarely affects the entire available bandwidth, and each frequency hop is at least 6 MHz, the radio transmitter has access to more than 100 frequencies within the spectrum to avoid interference and ensure that data gets through. In particularly harsh locations, you can configure Industrial Modem RF115 to retransmit data packets up to 10 times over 10 different frequencies to be absolutely certain that your data gets through. A 32-bit Cyclical Redundancy Check (CRC) also guarantees that the data sent matches the data received.

HOT NEW WIRELESS TECHNOLOGY!



Bolt it down! Durable mounting flange provides hard and fast connection—the only one you need for totally wireless communication!

Fixed-whip antenna

Heavy-gauge steel chassis

SPECIFICATIONS

Maximum Range — Up to 20 mi. (32 km) line-of-sight, depending on environment, geographical conditions, and optional antenna; Up to 60 mi. (96 km) with repeaters

Operating Environment — -10 to +60° C

Radio Frequency — 902- to 928-MHz spread spectrum; no FCC license required

Speed — Up to 115.2 Kbps full-duplex (uncompressed)

Interface — RS-232 (can support 2- or 4-wire RS-485 with the optional RS-485 Modules)

Connectors — DB9

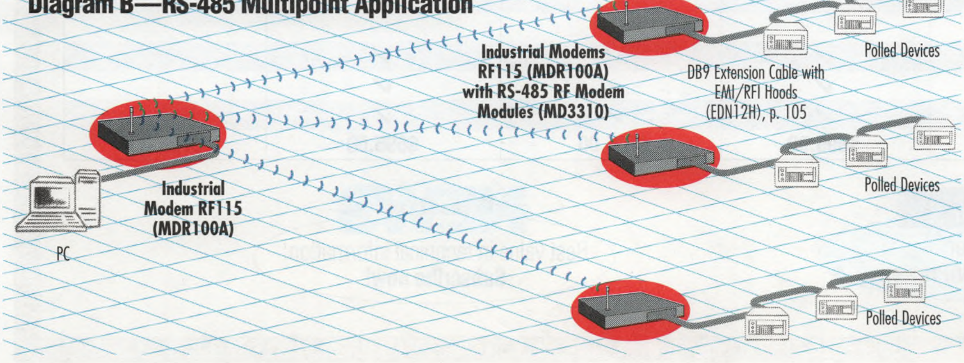
Power — 115-VAC, 60-Hz wallmount adapter (230-VAC, 50-Hz version on request)

Size — 2.5"H x 7.5"W x 11.3"D (6.4 x 19.1 x 28.7 cm)

Weight — 4.5 lb. (2 kg)

FAXBACK INFORMATION
Request Document Number: 15626
Call 412-746-5500 Anytime

Diagram B—RS-485 Multipoint Application


Industrial Modems RF115 (MDR100A) with RS-485 RF Modem Modules (MD3310)
DB9 Extension Cable with EMI/RFI Hoods (EDN12H), p. 105
Polled Devices
Polled Devices
Polled Devices
Industrial Modem RF115 (MDR100A)
PC

Item	Code	Price
Industrial Modem RF115 (Includes Fixed-Whip Antenna)	MDR100A	**$1795.00**
RS-485 RF Modem Modules		
2-Wire	MD3310	**$125.00**
4-Wire	MD3311	**$125.00**
Optional RF Antennas		
Omnidirectional with Magnetic Mount		
10-ft. Cable	MDR150-0010	**$210.00**
Omnidirectional with Bracket Mount		
10-ft. Cable	MDR151-0010	**$250.00**
20-ft. Cable	MDR151-0020	**$270.00**
30-ft. Cable	MDR151-0030	**$285.00**
50-ft. Cable	MDR151-0050	**$295.00**
100-ft. Cable	MDR151-0100	**$420.00**
Yagi (Unidirectional) with Bracket Mount		
25-ft. Cable	MDR152-0025	**$460.00**
50-ft. Cable	MDR152-0050	**$495.00**
100-ft. Cable	MDR152-0100	**$595.00**
EDQ Thumbscrew Cables (DB9)		
10-ft. (3.0)	EGM12D-0010	**$22.45**

remember to order cables

For other lengths, see p. 86.

Black Box Is *THE* Source for *ALL* Your Data-Center Communications Needs!

Count on Black Box to bring you all the speed, versatility, security, and ease of use that you need in a data-center modem. And our modems' tough commercial-grade construction holds up to years of heavy use.

Maximum Versatility.

BLACK BOX® Data-Center Modems include features that make them far more versatile than your ordinary modem: support for multiple lines, both dialup and leased, and compatibility with a wide range of equipment including synchronous devices such as routers and mainframes.

Easy Configuration.

BLACK BOX® Data-Center Modems are easy to install. And once they're installed, they're easy to configure. In addition to AT command set and remote configuration, most can be configured from the modem's front panel with easy pushbuttons and LCD panels.

Tight Security.

A modem that's accessible to both a network and an outside phone requires tight security—you don't want to let just anyone in. That's why most BLACK BOX® Data-Center Modems feature complete security including password and callback protection.

We Even Have Bell Standard Modems!

When you need a Bell Standard modem, you need a Bell Standard modem—not something sort of like a Bell Standard modem. Black Box still stocks Bell Standard modems for those legacy applications that require them. As always, you'll get Black Box reliability and *total* Bell Standard compatibility.

Rackmount Modems, Too!

Many of our popular Data-Center Modems are available in convenient rackmount versions. See **page 410** for more details about rackmounting your Data-Center Modems.

BLACK BOX
201BC/AS
MS/SI
TR
RS
CS
CD
RD
TD
TM
DATA
AL
LCL
RDL
RDLST
TALK
TTP
RTP
ST
POWER

*Yes, Black Box still has Bell Standard modems! See **page 409** for the Modem 201 BC/AS shown above.*

BLACK BOX
YES
NO
TALK/DATA
TR
CS
RS
CD
RD
TD

*BLACK BOX® Data-Center Modems are loaded with features like LED panels and pushbuttons to make operation easier. See the Modem 3400 on **page 408**.*

BUYER'S GUIDE

CHOOSE YOUR BLACK BOX® DATA-CENTER MODEM

Feature		Modem 34336 MD885A-R2 (page 407)	Modem 3400 MD880A (page 408)	Modem 32144 MD833A-R5 (page 408)	Modem 325 MD278A (page 409)	Modem 201 BC/AS MD796A (page 409)
33.6 Kbps		✓				
V.34 (28.8 Kbps)		✓	✓			
V.32 bis (14.4 Kbps)		✓	✓	✓		
V.32 (9600 bps)		✓	✓	✓	✓	
V.22 bis (2400 bps)		✓	✓	✓	✓	
Sync Data Compression						
Max. DTE Rate (Kbps)	Sync	33.6	28.8	19.2	9600	2400
	Async	230.4	115.2	57.6	19.2	2400
Security		✓	✓	✓	✓	
Dual Flash ROM		✓				
Remote Configuration		✓	✓	✓	✓	
Front-Panel Configuration		✓	✓	✓	✓	
Rackmount Card Version		✓	✓	✓	✓	✓
Price		$995.00	$895.00	$795.00	$695.00	$705.00

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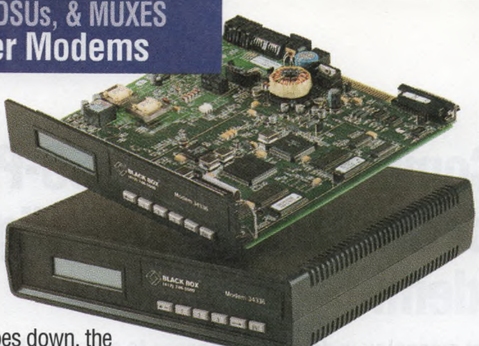
Modems & More VIPreview.

NEWS Connectivity™
Best value in technical information!
Subscribe now!

Modem 34336

The 33.6-Kbps Dialup Modem Chock-Full of Features!



- **Advanced ITU-T V.34 compliance.**
- **33.6-Kbps sync or 230.4-Kbps async speed.**
- **Data compression for even more throughput.**
- **Dual flash ROM—upgrade to new firmware while retaining your old firmware.**

Not only does this V.34 modem have the speed, but it's packed with more features than ever before.

The latest in Digital Signal Processing technology accelerates this Modem to a 33.6 Kbps. But you can still use it with your other installed modems—the Modem 34336 will automatically fall back to whatever standard it connects to. Send your faxes at 14.4 Kbps.

Complete dialing capability—the Modem 34336 recognizes V.25 bis or AT commands. The Modem will also dial a stored number upon DTR. This gives it the ability to connect to devices (like routers) that use bandwidth on demand and line backup via DTR. And if your primary line goes down, the Modem will automatically dial the backup line.

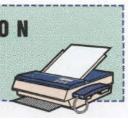
The Modem 34336 supports ITU-T V.42 bis and MNP® for error correction and data compression.

It also supports ITU-T V.54 tests. You can test the Modem from the front panel or from your PC via AT commands. Monitor the Modem status on the clear easy-to-read front-panel display or from a remote workstation.

Configure your Modem using the 2 x 20-character LCD panel and six front-panel push-buttons or standard AT commands.

And the Modem 34336 has "hacker-proof" security for your sensitive transmissions.

FAXBACK INFORMATION
Request Document Number: 16005
Call 412-746-5500 Anytime



SPECIFICATIONS

Alternate Fallback Capability — V.22, V.21, V.23
Data Rates — Sync: Up to 33.6 Kbps; Async: Up to 230.4 Kbps
Fax Standards — V.17, V.29, V.27 ter, V.21 Chan 2 T.30
Operation — 2-wire full-duplex dialup or leased; 4-wire full-duplex leased lines
Standards — V.34, V.32 bis, V.33, V.32, V.29 Fast Train, Bell 208 A/B, V.22 bis, Bell 212A, Bell 103
CE Approval — MD885C-R2 and 230-VAC version: MD885AE-R2
Connectors — (1) DB25 Female; (2) RJ-11; (2) RJ-45
Power — 115 VAC, 60 Hz (230-VAC version on request)
Size — Standalone: 2.5"H x 9.7"W x 10.7"D (6.4 x 24.6 x 27.2 cm)

Item	Code	Price
Modem 34336		
Standalone	MD885A-R2	**$995.00**
Rack Card	MD885C-R2	**$995.00**
	See V.32 Rack on p. 410.	
remember to order cables		
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
	For other lengths, see p. 83.	
	Specify gender when ordering.	

STILL USING THAT SLOW MODEM?

WE HAVE THE ACCESS SPEED YOU NEED—*AND WE DELIVER!*

The second edition U.S. Robotics® VIPreview.

It has all the network-access solutions you need. And we can't wait to deliver it to you.

It's FREE—just call 800-552-6816.

Black Box Corporation
The World's Source for Connectivity™
VOLUME 1 ISSUE 43
internet
In Your Home
Down the Street
Around the World
USRobotics
The Intelligent Choice in Information Access
U.S. Robotics Modems by Black Box Keep Your Business Connected!
VIPreview
- Fast 56-Kbps x2™ Modems Slash Your Phone Bills—Save Time and Money!
- The Right Connections for Your Business.

Call Black Box Today—412-746-5500.
EXPERT TECHNICAL SUPPORT

BLACK BOX®

USRobotics®
The Intelligent Choice in Information Access

Modem 3400

Full V.34 Compliance and a 50-Password Memory for Our Most Secure High-Speed Dialup Modem.

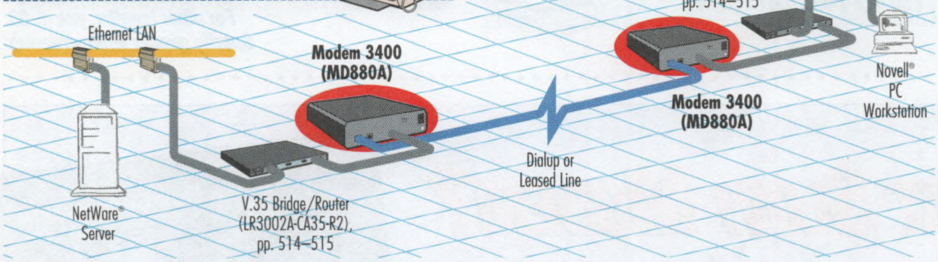
- **Exceptional choice for managing wide-ranging access to a central host or network.**
- **Programmable dialback security remembers codes for 50 nodes.**
- **100% compliant with V.34—28.8 Kbps!**

For top data-center security and high speed, our Techs agree: There's no better combination modem than our Modem 3400. It's an MIS manager's dream, with 50-number callback security that you program to control access from remote locations.

With all data-transfer calls originating from one Modem, you centralize and consolidate your corporate call billing. And with remote configuration, you can tend to all those distant modems without setting foot outside your office.

Plus—Modem 3400 is all V.34, the industry standard for fast dialup: Digital speeds without the monthly premium charge. Modem 3400 can transmit sync or async data on leased or dialup analog lines. And, of course, Modem 3400 has the full complement of standard functions required in today's data centers: Multiple configuration options (remote, front-panel LCD, or AT command set), full Group III fax capability, V.8-compliant automode, and automatic rate adaption. So you get the fastest possible data rates between two modems, if your lines are fully conditioned.

FAXBACK INFORMATION
Request Document Number: 13136
Call 412-746-5500 Anytime



SPECIFICATIONS

Diagnostics — V.54 remote loopback control; V.52 511 PN pattern; analog and digital loopback; test pattern
Operation — 2-wire full-duplex dialup or leased; 4-wire full-duplex leased lines
Speed — Up to 28.8 Kbps
Standards — V.34, V.32 bis, V.32, V.22 bis, V.21, Bell 212A, Bell 103
CE Approval — MD880A
Connectors — (1) DB25 (2) RJ-45
Power — 115 VAC, 60 Hz, 14 watts
Size — 2.5"H x 7"W x 9.6"D (6.4 x 17.8 x 24.4 cm)

Item	Code	Price
Modem 3400		
Standalone	MD880A	**$895.00**
Rackmount Card	MD880C	**$890.00**
For maximum performance, consider ordering...		
V.Fast Turbo Conditioner 2000 (**p. 419**)	MC413A	**$599.00**
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

remember to order cables

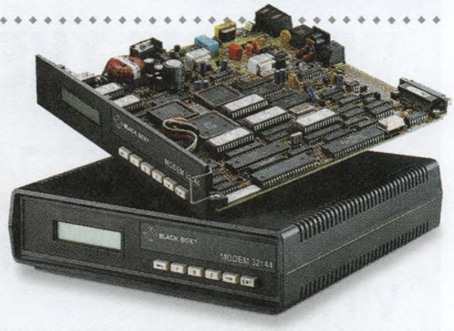
For other lengths, see p. 83.
Specify gender when ordering.

◆ ◆ ◆

Modem 32144

19.2-Kbps-V.Terbo Support—and Options for Use in Any Application!

DC-Powered Versions Available



- **Ideal for remote access—get callback security and remote configuration.**
- **Program unattended autodial and autoanswer at night when rates are lower with V.25 bis mode. Get autodial backup, too.**
- **Includes Bell 208 mode for legacy systems compatibility.**

This is a great modem for remote users. First, you get three levels of async security: Password, callback, or none. Next, you can configure it remotely. V.42 bis, V.32 bis, and MNP® 5 data compression give you maximum async data throughput—57.6 Kbps—for lower phone bills. And V.Terbo enables sync data to run 19.2 Kbps over 4-wire leased lines. Simulated switch-carrier operation (V.13) makes Modem 32144 perfect for synchronous IBM® mainframe networks.

SPECIFICATIONS

Configuration — AT Command set, or front-panel from PC
Operation — Full-duplex over 2- or 4-wire leased lines or dialup lines
Speed — Line: Up to 19.2 Kbps; DTE: 300 bps to 57.6 Kbps
Standards — V.Terbo, V.33, V.32 bis, V.32, V.25 bis, V.25, V.22 bis, V.22, V.17, V.13, and Bell 103, 212, and 208
CE Approval — MD833C-R5, ME833A-D24, ME833A-D48
Connectors — (1) DB25 female, (5) RJ-45 female, (1) 5-pin DIN
Power — MD833A-R5, MD833C-R5: 115 VAC, 60 Hz; MD833A-D24: 24 VDC; MD833A-D48: 48 VDC

FAXBACK INFORMATION
Request Document Number: 12544
Call 412-746-5500 Anytime

Item	Code	Price
Modem 32144 (AC-Powered)		
Standalone	MD833A-R5	**$795.00**
Rackmount Card	MD833C-R5	**$785.00**
Modem 32144 (DC-Powered)		
24-Volt DC	MD833A-D24	**$949.00**
48-Volt DC	MD833A-D48	**$995.00**
For your Modem 32144 Card, we recommend our V.32 Modem Rack (p. 410).		
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

remember to order cables

For other lengths, see p. 83.
Specify gender when ordering.

Modem 325

Our Best V.32 Modem—Secure, Reliable, and Easy to Use.

TECH SUPPORT'S PRODUCT OF CHOICE

- **Convenience plus: Configure and reconfigure it from your office or from a remote site.**
- **Reliability and security: MNP 1-4, passwords, and autodial backup.**
- **MNP 5 compression gives effective async speeds of 19.2 Kbps (sync, 9600 bps).**
- **MNP 2-4 error control and other features ensure clean transmissions.**

CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!
BLACK BOX
MODEM 325

Front-panel pushbuttons, a wide LCD display, and six LED indicators make this V.32 modem the one to pick for easy on-site or remote configuration—especially if you're working in central site and mainframe environments where modem configurations must be changed often. And with just a password, you can reconfigure the Modem over the phone.

You get high data throughput of 9600 bps with great reliability. And with MNP® 5 data compression, your data throughput jumps to 19.2 Kbps. That means faster transmission of such "memory hogs" as picture and image files, spreadsheet and database files, and large text files.

Suppose you're sending data over the worst phone lines. You don't have to worry about losing accuracy. With MNP 2-4 error control, and with echo canceling, line equalizing, and trellis coding—the Modem 325 ensures clean transmission.

It's versatile, too. You can send full-duplex async data at speeds from 1200 to 9600 bps, async data at 300 bps over dialup lines, and full-duplex async *or* sync data at 4800 or 9600 bps over leased lines. It's compatible with most V.32, V.22 bis, V.22, and Bell 103 modems.

The Modem 325 Ready Pak comes complete with a DB9F/DB25M Modem Cable (EVMBMC-0006).

FAXBACK INFORMATION
Request Document Number: 10865
Call 412-746-5500 Anytime

Item	**Code**	**Price**
Modem 325		
Standalone	MD278A	**$695.00**
Rackmount Card	MD278C	**$675.00**
Modem 325 Ready Pak includes the Modem 325 **plus (1)** 6-ft. (1.8-m) DB9F/DB25M Modem Cable		
Mount your Rack Cards in...		
Modem Rack II (**p.410**)	RM421A	**$1075.00**
Turn to page 410 for more about the Modem Rack II.		
remember to order cables: RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83. Specify gender when ordering.		

SPECIFICATIONS

Operation — Full-duplex
Standards — V.32, V.25 bis, V.22 bis, V.22, Bell 212, Bell 103
Interface — RS-232
Connectors — (1) DB25 female, (1) RJ-45, (1) RJ-11
Power — 115 VAC, 60 Hz

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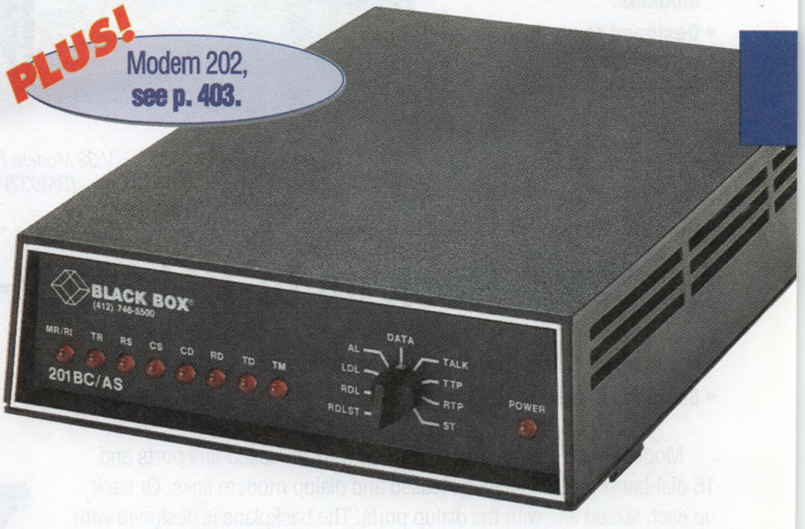
Modem 201 BC/AS

We Didn't Forget Our Bell 201 Customers.

PLUS! Modem 202, see p. 403.

Bell Standard Modem

- **Supports Bell 201 B or C at 2400 bps.**
- **Run sync or async, dialup or leased lines, point to point or multipoint.**



When you need a reliable 201 Modem, choose this workhorse. Use the nine-position front-panel rotary switch for loopback testing and easy configuration. It also features auto-answer convenience.

This Bell 201-compliant modem is compatible with many popular machines.

SPECIFICATIONS

Diagnostics — AI, DI, RDL, TP, ST
FCC Registration — AK396F-67811-DM-E
Operation — Half-duplex over 2-wire dialup or leased line; Half- or full-duplex over 4-wire leased line
Protocol — Asynchronous or synchronous
Speed — Up to 2400 bps
Interface — RS-232
Connectors — (1) DB25, (1) RJ-11, (1) RJ-45
Power — 115 VAC, 60 Hz, 20 watts
Size — 2.3"H x 8.8"W x 11.5"D (5.8 x 22.4 x 29.2 cm)
Weight — 3 lb. (1.4 kg)

Item	**Code**	**Price**
Modem 201 BC/AS	MD796A	**$705.00**
remember to order cables: RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83. Specify gender when ordering.		

Maximize Efficiency, Minimize Space Requirements—Rackmount Your Data-Center Modems.

FOR COMPARISON: DATA-CENTER RACK SYSTEMS

Features	Model	
	V.32 Modem Rack (RM032)	**Modem Rack II (RM421A)**
Modems Supported	Modem 34336 **(p. 407)** Modem 32114 **(p. 408)**	Modem 3400 **(p. 408)** Modem 325 **(p. 409)** Modem 201 BC/AS **(p. 409)**
Max. Number of Modems	8	16
Telephone Connnectors	(2) 50-Pin Telco Female Dial-Line Option: (8) RJ-45 Female Leased-Line Option: (8) RJ-11 Female (8) 4-Wire Screw Terminals	(16) RJ-45 Dialup (16) RJ-45 Leased Line
Power	115 VAC, 60 Hz	115 VAC, 60 Hz (230 VAC, 50 Hz available)
Transformers	(4) per Rack	(2) per Rack
On/Off Switch	✔	
LEDs	Power	Power
Front Panel	Locking Bar	Hinged Door
Cabinet	19" (48.3 cm)	19" or 23" (48.3 or 58.4 cm)
Size	10.5"H x 19"W x 11.8"D (26.7 x 48.3 x 30 cm)	7"H x 19"W x 11"D (17.8 x 48.3 x 28 cm)
Weight	25 lb. (11.3 kg)	32 lb. (14.5 kg)

V.32 Modem Rack

The Right Rack for up to Eight V.32 Modems.

- **Holds up to eight modems.**
- **Designed to work with Modem 34336 and Modem 32144.**

Leased-Line Option (RM034-C)

Dial-Line Option (RM033-C)

V.32 Modem Rack (RM032)

Organize your remote communications. The V.32 Modem Rack is designed to hold up to eight Modem 34336 or Modem 32144 models in one compact desktop or rackmountable Rack.

Dialup and leased-line options are available as backplates to fit the Rack.

Item	Code	Price
V.32 Modem Rack (8-Card)	RM032	**$815.00**
Dial-Line Option (Back Panel for Rack)	RM033-C	**$93.00**
Leased-Line Option (Back Panel for Rack)	RM034-C	**$77.00**

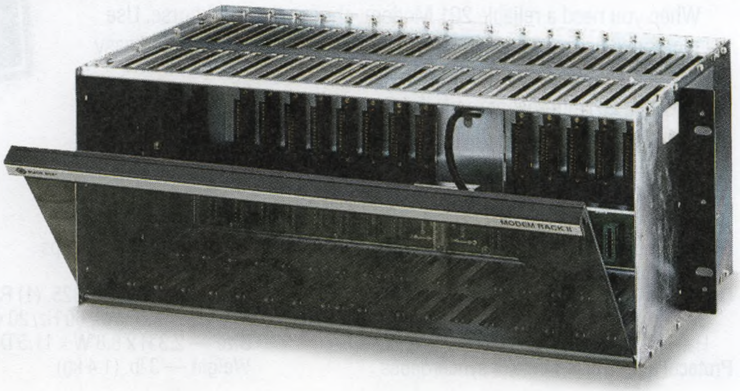
* * *

Modem Rack II

Rack up to 16 Leased-Line and Dialup Modem Cards.

- **Holds up to 16 modem cards in a standard 19" or 23" rack.**
- **Supports leased or dialup lines.**

Modem Rack II is specially designed with 16 leased-line ports and 16 dial-backup ports. Manage leased and dialup modem links. Or back up each leased line with the dialup ports. The backplane is designed with three connectors for each slot: DB25, leased-line, and dial backup line. A recessed power bus on the inside of the backplane distributes power to all the cards. No power cords dangle out the back.



Item	Code	Price
Modem Rack II	RM421A	**$1075.00**

Network Data Security • Security Administrator

Every 20 Seconds Someone Breaks into a Computer Network. Is Your System Next?

Call Black Box *NOW* for *Complete* Network Security!

- **Network Data Security units authenticate incoming calls, generate random security keys, then DES-encrypt data in real time. When a call's finished, so is the security key.**
- **Totally automatic and transparent to end users. No passwords, PINs, tokens, or dial backups!**
- **Use Security Administrator to control off-site, lost, or stolen Network Data Security units.**

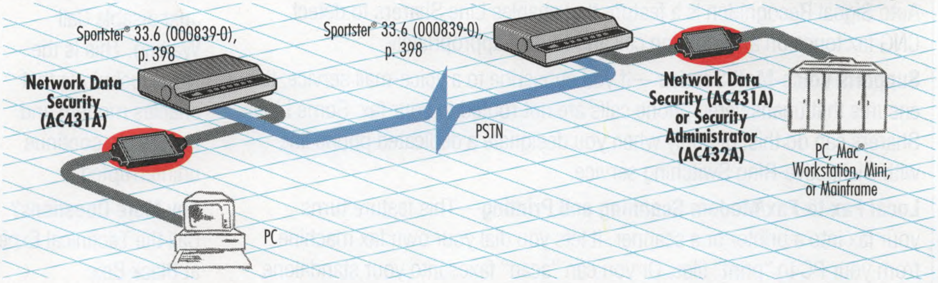
Just one modem dialing into your network exposes your entire system—to the wrong people. But your business depends on remote access: for telecommuters, field sales staff, real-time customer support. Now you can safely open up your network for mission-critical dial-in access.

Network Data Security—This unit makes access easy for authorized users but stops intruders cold—before they reach your host or server. Install one at your central site between the modem and your host. Then distribute one to each of your authorized remote users—up to 500 in all! These units, plugged in-line between each remote modem and PC, initiate a dual challenge/response authentication process that ensures user-authorization before commencing a peer-to-peer or client/server datacomm session.

Network Data Security also keeps intruders from eavesdropping on sensitive in-progress transmissions by DES-encrypting the data signals of all calls—in real time.

Security Administrator—This addition to our frontline security force offers an extra layer of protection for your network. It's a hardware/software combo designed exclusively for Network Data Security devices. It enables you to control them remotely by managing their authorization programming without accessing the physical units. Plug it in-line between your host computer and modem, then use it to enable/disable lost or stolen Network Data Security devices. It includes an RS-232 cable and software for Windows® 3.1 that enables you to search/verify an existing ID, remove an ID from security authorization tables, and much more!

FAXBACK INFORMATION
Request Document Number: 14584
Call 412-746-5500 Anytime


Sportster® 33.6 (000839-0), p. 398
Network Data Security (AC431A)
PC
PSTN
Sportster® 33.6 (000839-0), p. 398
Network Data Security (AC431A) or Security Administrator (AC432A)
PC, Mac®, Workstation, Mini, or Mainframe

SPECIFICATIONS

Network Data Security:

Authorization Table — Nonvolatile memory, 5-year lithium battery backed up
Client/Server and Peer-to-Peer — Up to 500 nodes can be accessed by each authorized device
Data Encryption Speed — >1 Mbps
Encryption — Full DES Standard, 56-bit key, plus cipher-block chaining
Key Generation — Automatic, random per session; key is never available to user or transmitted
Serial Speed — Up to 38.4 Kbps (autodetecting)
Power — 9 VDC, <200 mA, external power transformer included
Size — 1.8"H x 2.8"W x 4.9"D (4.6 x 7.1 x 12.4 cm)

Security Administrator:

System Requirements — Windows 3.1 or higher
Power — 9 VDC, <300 mA, external power transformer included
Size — 1.4"H x 2.8"W x 4.9"D (3.6 x 7.1 x 12.4 cm)

Item	Code	Price
Network Data Security	AC431A	**$285.00**
Security Administrator	AC432A	**$450.00**

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Programmable Security Guard (PSG)

Add Password Security to the Modems You Already Own.

- **Choose callback or one corporate password, or program up to 64 separate user passwords.**
- **Programmable function so you can restrict selected passwords for limited access.**

PROGRAMMABLE SECURITY GUARD
RESET
TXA RXA TXB RXB
PWR
BLACK BOX®

This in-line programmable unit is a great affordable way to add password security to any unguarded async communication system.

Use it to limit host access to authorized users only! An onboard clock and 64-password memory enable you to program separate passwords for limited access during specified time periods.

For extra security, the callback option makes callers enter a valid password before the modem calls them back—at a number you program.

SPECIFICATIONS

Memory — 1-KB buffer
Pins Supported — 1–8, 20, 22
Speed — 45.5 bps to 38.4 Kbps (port-selectable)
CE Approval — Yes
Interface — Asynchronous RS-232
Connectors — (2) DB9 female
Indicators — (1) RXD and (1) TXD per port
Power — Wallmount transformer
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)
Weight — 2 lb. (0.9 kg)

Item	Code	Price
Programmable Security Guard (PSG)	SD015A	**$305.00**
remember to order cables: 9-Pin to AT® Cable, 10-ft. (3.0-m)	EHM025-0010	**$18.30**
9-Pin to DTE Cable, 10-ft. (3.0-m)	EHM023-0010	**$21.05**
9-Pin to Modem Cable, 10-ft. (3.0-m)	EHM024-0010	**$21.05**
9-Pin to PC Cable, 10-ft. (3.0-m)	EHM026-0010	**$21.05**

Black Box Explains...

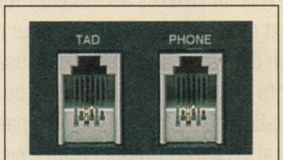
How to Find the Right Line-Sharing Solution.

Black Box makes finding the perfect Line-Sharing device easy. Use the Guide at the bottom of this page to find the one that's right for you!

Number of Phone Lines—Indicates the number of telephone-company lines directly attached to the Line-Sharing device.

Devices Supported—Indicates the total number of phones, modems, answering machines, or other such devices that can be attached to the Line Sharer to place outgoing or receive incoming calls.

Switchable Ports—This relates to the number of devices that can be attached to the Line Sharer, but it's a bit more complex. Consider our LineShare 120H. The Guide **below** shows that it supports three attached devices, but has only two switchable ports. That's because the Telephone Answering Device (TAD) port and the Phone port share the same circuit. They're wired together as a common port. Both will ring when a call comes in and you can't select just one to answer. You can program a TAD to answer after several rings, but even though there are three ports, there are only two possible destinations: either the Fax/Modem port or the TAD and Phone ports.



Some Line Sharers have common ports that share a circuit and aren't switchable. The Guide below indicates which units have this configuration.

Distinctive-Ring Switching vs. Auto Signal Recognition—Distinctive-Ring Switching (DRS) is a service offered by your local telephone company. It enables one telephone line to support multiple phone numbers, each of which is identified during an incoming call by a different ringing pattern. Auto Signal Recognition is a feature that enables Line Sharers to detect CNG fax tones on an incoming call and route it appropriately.

Supports Voice-Mail Service—If you subscribe to a voice-mail service, this ensures that unanswered phone calls are not routed to your fax. Some Line Sharers can do this, but only when you designate a dedicated phone line with Distinctive-Ring Switching service.

Local Fax-to-Fax/Modem Scanning and Printing—This feature turns your fax into a printer or a scanner. It lets you dial your own fax machine from your PC to "print" files. Or you can "scan" faxes into your standalone fax machine and send them to your own PC.

Barge-In Protection—A Line-Sharer with Barge-In Protection prevents instant modem disconnects and "garbage" faxes if someone accidentally picks up another phone.

Emergency Override—In case of an emergency, you can cancel Barge-In Protection to gain access to the phone line.

Auto Switching to Multiple Modems—This feature provides automatic access to the modem you select. It's ideal for supporting unattended operations such as batch-processing, security alarm monitoring, or other off-hours applications.

Enhanced Dialup Security—This feature is also only available when accessing a LineShare Pro from a LineShare Master. Since the Master unit specifies which remote port to access by emitting key frequencies that the Pro unit recognizes, no calls get through without your user-defined code.

Multiport One-Call Routing—Another feature of the LineShare Pro/Master combination. It enables you to access multiple devices at a remote site via one phone line—during the same call!

And Finally...What about Call Waiting?—Incoming Call-Waiting signals can disrupt fax or modem transmissions and interrupt operations in a Line-Sharing application. But the solution is simple: Just disable Call Waiting. This is the same technique that enables modem and fax calls to continue uninterrupted.

Check Out How You Can Save!

The "old" way:

A phone, modem, and fax are on three separate lines, each costing $30 per month. Your line expenses for one year total $1080!

The Black Box Way:

With the LineShare 120H (p. 413), three devices can be put on one line to save you $60 a month! 120H pays for itself in less than six weeks!

Save $720 a year!

Any More Questions?
Call the Technical Experts at Black Box:
412-746-5500.

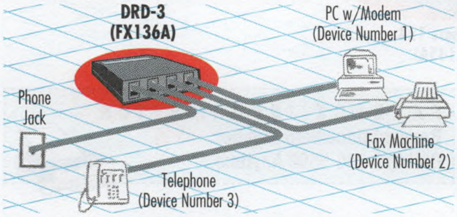
PHONE-LINE SHARING SOLUTIONS

Features	Models							
	Distinctive-Ring Call Manager		LineShare 120H	LineShare 120B	LineShare 230B	LineShare Pro	LineShare 1 x 4	LineShare 16 x 4
	DRD-2 p. 413	DRD-3 p. 413	p. 413	p. 413	p. 413	p. 415	p. 414	p. 414
Number of Phone Lines	1	1	1	1	1 or 2	1	1	4
Devices Supported	2	3	3	3	4	4	4	16
Switchable Ports	2	3	2	2	3	4	4	16
Distinctive-Ring Switching (DRS)	✓	✓		✓	✓	✓		
Auto Signal Identification (CNG Recognition)			✓	✓	✓	✓	✓	✓
Supports Voice-Mail Service (Requires DRS)	✓	✓						
Local Fax-to-Fax/Modem Scanning and Printing					✓			
Barge-In Protection			✓	✓	✓	✓		✓
Emergency Override						✓		
Auto Switching to Multiple Modems*						✓		
Enhanced Dialup Security*						✓		
Multiport One-Call						✓		
Code	FX135A	FX136A	FX120A	FX121A	FX126A	FX150A	FX145A	FX160A
Price	**49.95**	**59.95**	**$89.95**	**$129.95**	**$189.95**	**$345.00**	**$129.95**	**995.00**

* Requires a connection to a LineShare Master Unit (FX155A), see **p. 415.**

Distinctive-Ring Call Manager (2- and 3-Line)

- Automatically routes calls to two or three devices from just one telephone line.
- Uses patterns from your Distinctive-Ring phone service to send calls appropriately.
- Eliminates monthly charges for extra lines.
- DRD-2 mounts conveniently on hardware.
- DRD-3 takes little space on your desktop.


DRD-3
(FX136A)
PC w/Modem
(Device Number 1)
Phone
Jack
Fax Machine
(Device Number 2)
Telephone
(Device Number 3)

Deciding whether to Order Another Phone Line? Wait! We Have a Distinctive Alternative.

SPECIFICATIONS

Operation — Full-duplex
Connectors — FX135A: (2) RJ-11 female, (1) Pigtail cable with RJ-11 male; FX136A: (4) RJ-11 female
Power — From the incoming call
Size — FX135A: 2"H x 3"W x 1"D (5 x 7.6 x 2.5 cm); FX136A: 1.8"H x 5.8"W x 6.3"D (4.6 x 19.3 x 6.4 cm)
Weight — FX135A: 0.2 lb. (0.1 kg); FX136A: 0.4 lb. (0.2 kg)

FAXBACK INFORMATION
Request Document Number: 16878
Call 412-746-5500 Anytime

BLACK BOX
(412) 746-5500
DRD-2
DRD-3

Top: FX135A;
Bottom: FX136A

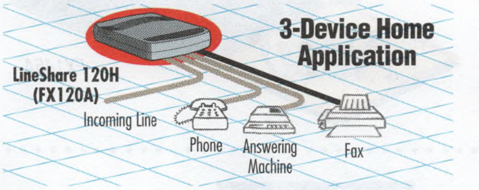
Item	Code	Price
DRD-2	FX135A	**$49.95**
DRD-3	FX136A	**$59.95**

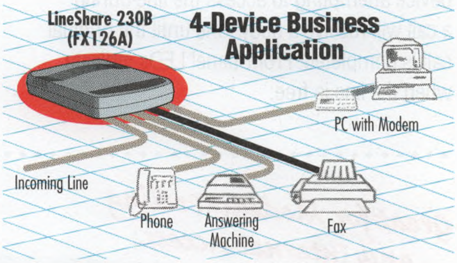
* * *

LineShare 120H • LineShare 120B • LineShare 230B

Plug In Three or Four Devices to Your Phone Line!

New
BLACK BOX®
(412) 746-5500
LineShare 120H
POWER


3-Device Home Application
LineShare 120H
(FX120A)
Incoming Line
Phone
Answering Machine
Fax


LineShare 230B
(FX126A)
4-Device Business Application
PC with Modem
Incoming Line
Phone
Answering Machine
Fax

MORE! Phone-Line Sharers, **see pp. 414–415.**

LineShare 120H

- **Connects three devices to one phone line.**
- **Talk *and* receive faxes during one call.**

Hook up your telephone and answering machine—and your fax or modem—onto just one phone line with the new LineShare 120H. LineShare 120H brings security and versatility to your home office. It has features which enable you to block those annoying junk faxes. And you can even transfer from phone to fax to receive a document—all in the same call!

LineShare 120B

- **Automatic fax recognition.**
- **Also works with distinctive-ring service.**
- **Remote-message notification feature.**

Connect your telephone and answering machine, plus your modem and fax, to a single phone line—and have a special tone message forwarded to any desired number, so you don't miss an important call or fax! The new LineShare 120B works smoothly with distinctive-ring service. It routes all calls directly to your connected devices, or it can be set so all extension phones will ring normally. And it also works with voice mail and Caller ID services.

LineShare 230B

- **Connects four devices to one phone line.**
- **Converts your fax into a scanner or printer.**

LineShare 230B connects your phone, answering machine, fax, and modem to a single telephone line. It's even compatible with two-line phones. The 230B can convert your fax into a full-page, multidocument scanner or printer—without any software installation!

SPECIFICATIONS

Line Type — 2-wire dial
Operation — Full-duplex
Connectors — FX120A–FX121A: (4) RJ-11 female; FX126A: (5) RJ-11 female
Size — 2.3"H x 6.5"W x 7.3"D (5.8 x 16.5 x 18.5 cm)

Check Out How You Can Save!

The "old" way:

A phone, modem, and fax are on three separate lines, each costing $30 per month. Your line expenses for one year total $1080!

The Black Box Way:

With the LineShare 230B, three devices can be put on one line to save you $60 a month! LineShare 230B pays for itself in less than three months!

Save $720 a year!

FAXBACK INFORMATION
For LineShare 120H: 18272,
For LineShare 120B: 18289,
For LineShare 230B: 18296,
Call 412-746-5500 Anytime

Item	Code	Price
LineShare 120H	FX120A	**$89.95**
LineShare 120B	FX121A	**$129.95**
LineShare 230B	FX126A	**$189.95**
remember to order cables — RJ-11 Modular Cable, 14-ft. (4.3-m) Cross-Pinned	EL04M-14	**$3.95**

LineShare 1x4

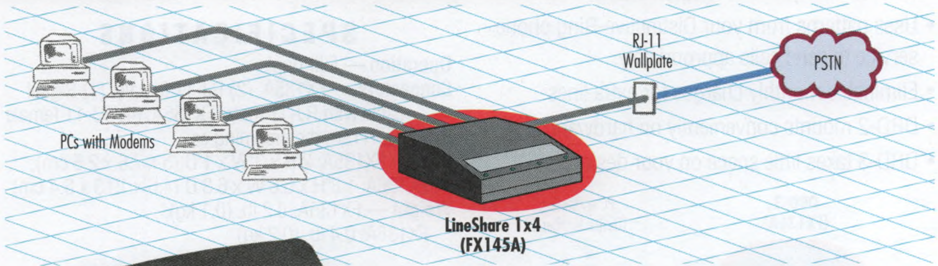
Share One Outbound Phone Line between Four Users.

- **Perfect for Internet access for multiple computers.**
- **Provides data integrity between transmissions.**
- **Front-panel LEDs show line availability.**

Don't pay for unnecessary dedicated phone lines! Up to four separate devices, such as modems or fax machines, can share one outbound phone line with the LineShare 1x4.

Say you want Internet access for the four PCs in your department. After powering up the LineShare 1x4, simply plug the phone line and all four computer modems into the ports on the LineShare 1x4's rear panel.

Each device receives unlimited individual connection to the phone line. Once a call is established, the device will maintain complete isolation for the duration of the call. Any other device attempting to access the line during a call will receive a busy tone until the original call is completed. Front-panel LEDs indicate when the line is free.



BLACK BOX® (412) 746-5500
LineShare 1x4
POWER
New

FX145A

FAXBACK INFORMATION
Request Document Number: 18265
Call 412-746-5500 Anytime

SPECIFICATIONS

Interface — PSTN
Connectors — (5) RJ-11 female
Power — 115-VAC wallmount transformer
Size — 2.3"H x 6.5"W x 7.3"D (5.8 x 16.5 x 18.5 cm)

Item	Code	Price
LineShare 1x4	FX145A	**$129.95**
remember to order cables: RJ-11 (4-Wire) Modular Cable 14-ft. (4.3-m), Cross-Pinned	EL04M-14	**$3.95**

For other lengths or pinnings, see p. 71.

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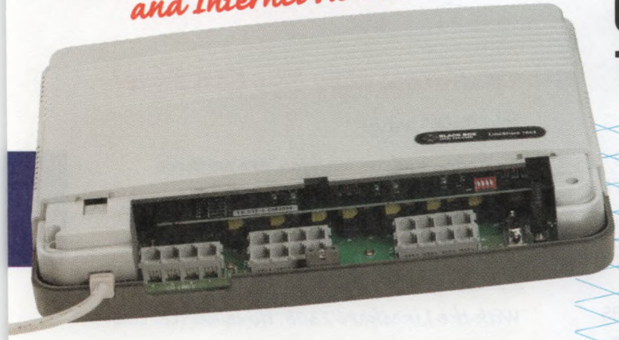
Great for Modem-Pooling and Internet Access.



LineShare 16x4

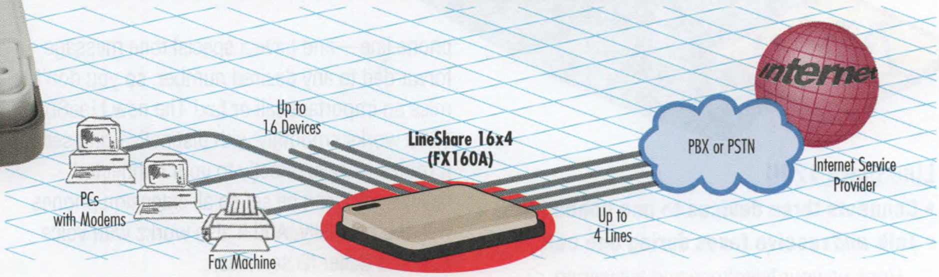
Get BIG Savings with Our BEST Line Sharer. 16 Users Can Share Four Phone Lines!

- **Four shared lines for as many as 16 users!**
- **Supports modems, phones, faxes.**
- **Auto CNG detection routes incoming faxes, saving you the cost of a dedicated line.**
- **Completely configurable by PC or by phone.**

The LineShare 16x4 enables dial-line access for up to 16 devices over four phone lines! It's a great way to support multiple phone links. Share access to phones, faxes, modems, cordless phones—any analog device.

You also get enhanced network security. How? LineShare 16x4 is a standalone modem pool that keeps the rest of the world away from your LAN!

Compared to the cost of adding 16 new lines or paying the phone company to upgrade your PBX, LineShare is a can't-miss bargain!



Check Out How You Can Save!

The "old" way:

Per-device phone-line connection.......$40

Monthly Federal tax per line............$3.50

Multiply by 16 devices= $696 per month!

That's $8352 per year!

The Black Box Way:

Buy LineShare 16x4 for $995

Put 16 devices on four lines for

$174 per month, or 2088 per year!

CALL NOW!

Save nearly $5300!

SPECIFICATIONS

Connectors — (20) RJ-11: (4) incoming ports; (16) extension ports
Power — 120 VAC, 60 Hz
Size — 2.5"H x 13.5"W x 9.5"D (6.4 x 34.3 x 24.1 cm)
Weight — 3.2 lb. (1.5 kg)

FAXBACK INFORMATION
Request Document Number: 16861
Call 412-746-5500 Anytime

Item	Code	Price
LineShare 16x4	FX160A	**$995.00**
remember to order cables: RJ-11 (4-Wire) Modular Cable 14-ft. (4.3-m), Cross-Pinned	EL04M-14	**$3.95**

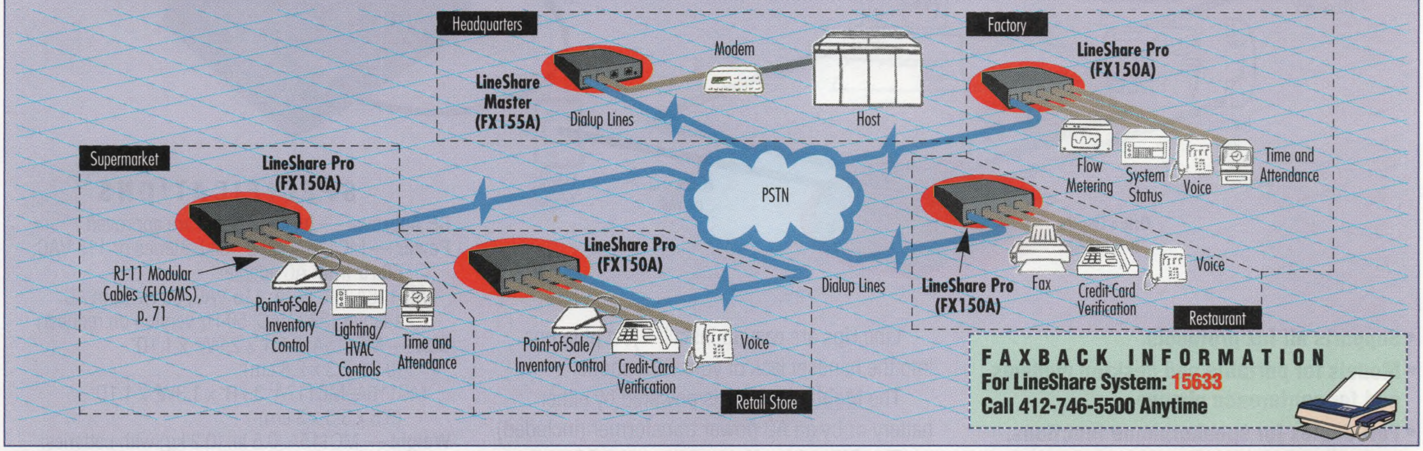
For other lengths or pinnings, see p. 71.

Automate Data Collection *and* Shrink Your Costly Phone Bills!

With the LineShare System, you can collect data on sales and inventory from branch business sites—without adding extra phone lines!

The System enables your data-collection transmission to be piggybacked onto the same lines used for voice calls. And all your remote business sites can transmit information for centralized data collection over one phone line! Why have a dedicated line for data collection if you use it only 5% of the day?

Connect up to four remote devices to a single line with LineShare Pro and LineShare Master. High phone bills? Not a problem anymore! And you can use the same phone line for faxing or credit-card verification, too. LineShare is perfect for small businesses, retail operations, especially franchise stores, restaurant chains, and auto-rental companies. Data-intensive public utilities will find the LineShare system indispensable.


Headquarters
LineShare Master (FX155A)
Dialup Lines
Modem
Host
Factory
LineShare Pro (FX150A)
Flow Metering
System Status
Voice
Time and Attendance
Supermarket
LineShare Pro (FX150A)
RJ-11 Modular Cables (EL06MS), p. 71
Point-of-Sale/ Inventory Control
Lighting/ HVAC Controls
Time and Attendance
PSTN
LineShare Pro (FX150A)
Point-of-Sale/ Inventory Control
Credit-Card Verification
Voice
Retail Store
Dialup Lines
LineShare Pro (FX150A)
Fax
Credit-Card Verification
Voice
Restaurant

FAXBACK INFORMATION
For LineShare System: 15633
Call 412-746-5500 Anytime

LineShare Pro

TEL LINE-IN
PORT 1
PORT 2
PORT 3
PORT 4
12VAC
BLACK BOX (412) 746-5500
LineShare Pro
ON/PORT 1
PORT 2
PORT 3
PORT 4

- **Collect data from multiple devices at multiple locations. One phone line is all you need.**
- **Connect phones, faxes, modems—even credit-card verifiers. Setup is simple!**
- **All ports are switchable so you get fully programmable access to up to five devices.**
- **Access is keyed to the frequencies you program. That means enhanced security!**

LineShare Pro works in concert with the LineShare Master to provide an exceptional line-sharing solution ideal for automated data collection. Use it to direct calls automatically to phones, faxes, or answering machines from a single incoming line. And since it supports fully programmable access when used with our LineShare Master (**below**), we suggest attaching remote modems back to a central host/LineShare Master location and linking data-collection devices for batch processing after-hours. Emergency override gives instant priority to outgoing calls. Comes in 115-VAC or 48-VDC models.

SPECIFICATIONS

Connectors — (5) RJ-11
Power — FX150A: 115 VAC; FX150A-D48: 48 VDC
Size — 1.8"H x 5.8"W x 6"D (4.6 x 14.7 x 15.2 cm)
Weight — 3 lb. (1.4 kg)

Item	Code	Price
LineShare Pro	FX150A	**$345.00**
LineShare Pro-D48	FX150A-D48	**$745.00**
remember to order cables	RJ-11 (4-Wire) Modular Cable, 7-ft. (2.1-m) Straight-Pinned EL04MS-07	**$2.95**

For other lengths and pinnings, see p. 71.

◆ ◆ ◆

LineShare Master • LineShare Rack

- **Program this centralized Master unit to access multiple devices via a remote LineShare Pro—all from just one phone line.**
- **Time-sensitive key frequencies direct calls appropriately and help thwart hackers.**
- **Use a single-line standalone unit or rack 12 four-line Cards for complete control.**

Program connections to multiple remote devices from a single LineShare Master unit. Installed at your host site, it transmits your preprogrammed signals to route calls to the device of your choice.

Just one Master unit is all you need to dial multiple devices and multiple remote sites. It's the perfect combination solution for retrieving important business data after-hours and getting the most use out of your existing phone line.

It's available standalone or as a rackmount card. LineShare Rack holds up to 12 of the four-line Master units to support a total of 48 lines—for maximum control, savings, and efficiency.

TEL-LINE IN
FAX/ MODEM
12VAC
BLACK BOX (412) 746-5500
LineShare Master
ON

Item	Code	Price
LineShare Master	FX155A	**$195.00**
LineShare Master-4	FX156C	**$695.00**
LineShare Rack	FX157A	**$2495.00**
remember to order cables	RJ-11 (4-Wire) Modular Cable, 7-ft. (2.1-m) Straight-Pinned EL04MS-07	**$2.95**

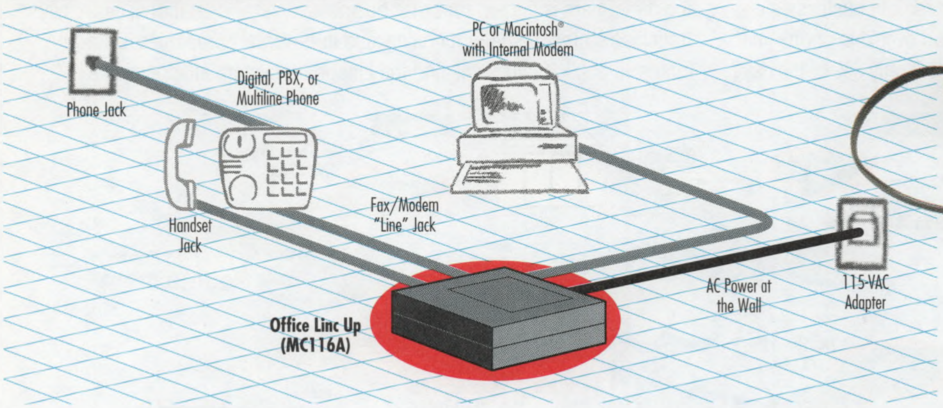
For other lengths and pinnings, see p. 71.

SPECIFICATIONS

Connectors — (4) RJ-11
Power — FX155A, FX157A: 115 VAC, 60/50 Hz
Size — FX155A: 1.8"H x 5.8"W x 6"D (4.6 x 14.7 x 15.2 cm); FX156C: 1"H x 5.5"W x 11.5"D (2.5 x 14 x 29.2 cm); FX157A: 7"H x 19"W x 15"D (17.8 x 48.3 x 38.1 cm)
Weight — FX155A: 2 lb. (0.9 kg); FX156C: 2 lb. (0.9 kg); FX157A: 28 lb. (12.7 kg)

Linc Ups

Connect Your Modem or Speakerphone to a Digital PBX Phone—Easily.



Office Linc Up
Conference Linc Up
BLACK BOX (412) 746-5500
Mobile Linc Up

- **Supports all fax protocols.**
- **Models for portable and desktop modems and for conference phones.**
- **Full-duplex for speakerphone functions.**

Most large organizations use a digital PBX system for their phones—not a problem unless you want to connect an analog modem or a speakerphone. Black Box has the solution: Linc Ups.

Linc Ups are easy to install—just plug one into the handset jack of your PBX phone.

The **Mobile Linc Up** is powered by either battery or by an AC power transformer (included).

The **Office Linc Up** is powered by AC power only for use with a desktop modem.

The **Conference Linc Up** connects today's advanced conference phones to a PBX system. Full-duplex operation ensures top sound quality.

SPECIFICATIONS

CE Approval — All items listed are approved

Power — MC115A: (2) 9-volt batteries or 115 VAC, 60 Hz from AC adapter; MC116A–MC117A: 115 VAC, 60 Hz from AC adapter (230-VAC, 50-Hz version on request)

Size — MC115A: 3.8"H x 2.9"W x 1.1"D (9.6 x 7.3 x 2.8 cm); MC116A–MC117A: 3.7"H x 1.3"W x 1.1"D (9.5 x 3.5 x 3 cm)

Weight — MC115A: 0.5 lb. (0.2 kg) with batteries; MC116A–117A: 0.2 lb. (0.1 kg)

Item	Code	Price
Mobile Linc Up	MC115A	**$149.00**
Office Linc Up	MC116A	**$119.00**
Conference Linc Up	MC117A	**$139.00**

* * *

The Eliminator

Eliminate Aggravation! Now You Can Protect Your Voice/Fax/Modem Calls from Accidental Phone-Extension Pickups.

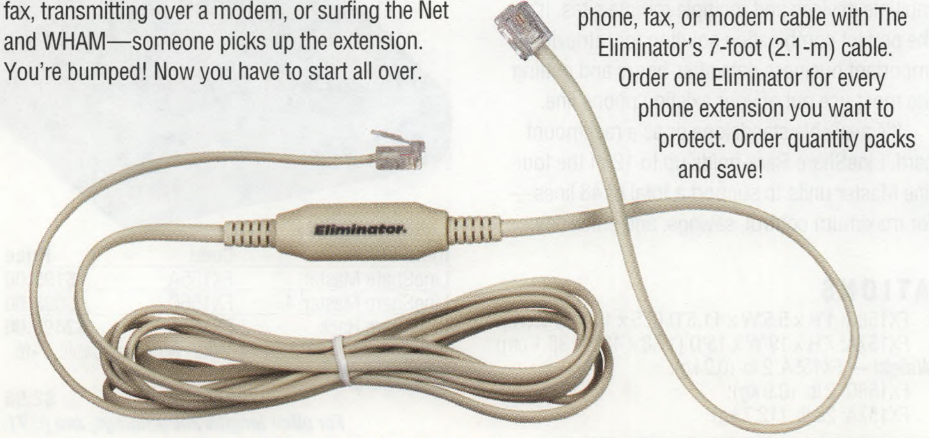
- **Protects modem/Internet sessions from accidental phone-extension pickups.**
- **Prevents unintended fax-transmission interruptions.**
- **Ensures private telephone conversations.**

If you're like most home- or small-office computer/fax/modem users, you have a single telephone line and a number of extensions. And you've probably had the experience of sending a fax, transmitting over a modem, or surfing the Net and WHAM—someone picks up the extension. You're bumped! Now you have to start all over. Now you have to resend your fax. Resend your data. Reconnect to the Internet. It's frustrating.

End the frustration with The Eliminator. Plug one into every phone extension you want to protect. Then enjoy the protection and privacy of uninterruped and private phone, fax, and modem calls. The Eliminator actually blocks the extension phone connection. As soon as you hang up, all extensions are cleared.

Install in seconds. Just replace your phone, fax, or modem cable with The Eliminator's 7-foot (2.1-m) cable.

Order one Eliminator for every phone extension you want to protect. Order quantity packs and save!



> ***"The Eliminator saved my marriage! I was constantly getting disconnected from the Internet whenever my wife picked up a phone extension at home. Then I saw The Eliminator, ordered one, and have been smoothly surfing the Net ever since."***

FAXBACK INFORMATION
Request Document Number: 17484
Call 412-746-5500 Anytime

Item	Code	Price
The Eliminator		
1 Eliminator	FA100	**$14.95**
2 Eliminators	FA100-2	**$25.95**
6 Eliminators	FA100-6	**$70.95**

Phone Coupler II

Connect Your Laptop Modem or Fax to Any Style Telephone—Digital, Hard-Wired, Square—Anywhere in the World!

SPECIFICATIONS

Operation — Full- or half-duplex
Speed — Data or fax: up to 14.4 Kbps with V.42 and V.42 bis error correction/data compression
CE Approval — Yes
Connectors — (1) RJ-11 female
Power — 9-V battery

- **Acoustic coupler makes the connection.**
- **Supports 14.4 Kbps via electronic phones, 2400 bps via U.S. pay phones.**
- **Enables user to send or receive faxes, transmit data, and check e-mail from a portable computer.**
- **V.42 and V.42 bis error correction and data compression.**

When you're traveling, this could be your only link to the outside world. Because there are so many different kinds of phones—digital, hard-wired, square—you need Phone Coupler II.

Phone Coupler II is a high-speed acoustic coupler that connects your modem to virtually any phone. With it, you can send and receive faxes, transmit data, check e-mail, or access online services from your portable or notebook computer.

Using advanced signal-processing technology, Phone Coupler II can interface with the telephone system where no direct connection is available.

Communicate over pay, cellular, hotel, digital/PBX, and international telephones up to 14.4 Kbps. Even send data up to 2400 bps via US pay phones.

Phone Coupler II comes with a 9-volt alkaline battery and an adapter disk to work with the square handset mouthpiece on AT&T® Merlin® phones.

Phone Coupler II supports ITU standards for high-speed data transfer, even data compression and error correction.

Item	Code	Price
Phone Coupler II	MC155A-R2	$149.00

◆ ◆ ◆

Global Teleconnect Kit

The Best International Survival Kit for Globe-Trotting Professionals!

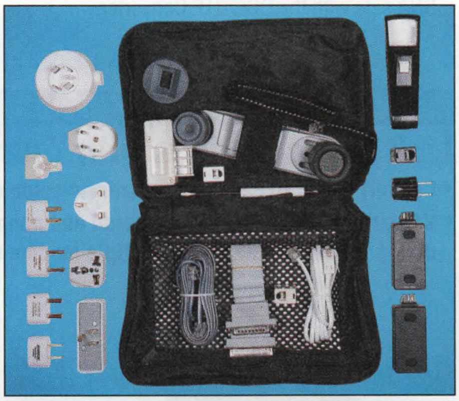
- **Use your modem with phones anywhere!**
- **Eight power adapters included.**
- **Nine phone adapters included.**
- **Includes tools, too! Kit comes with a Phillips screwdriver, flashlight with magnifier, printer cable, and line cord.**

Traveling abroad? Without the right adapters, connecting your portable PC for modem or fax links can be impossible. Now get everything you need all in one durable nylon case!

The Global Teleconnect Kit enables users to connect portable computers and modems practically anywhere in the world. The Kit contains essential connectivity tools plus the most popular international power-plug and telephone adapters.

An adjustable High-Speed Telecoupler is also included in the Kit. Get acoustic links to virtually any phone handset—get data and fax speeds up to 14.4 Kbps!

The nylon case also comes with a protective pocket. It's perfect for carrying a PCMCIA modem card or any other additional accessories.



SPECIFICATIONS

Communication Line — Standard telephone lines (PSTN)
Operation — Full- or half-duplex
Speed — Data or fax: up to 14.4 Kbps with V.42 and V.42 bis error correction/data compression
Connectors — (1) RJ-11 female
Power — 9-V battery
Size — 7.7"H x 2"W x 2.2"D (19.6 x 5.1 x 5.6 cm)
Weight — 0.6 lb. (0.3 kg)

FAXBACK INFORMATION
Request Document Number: 13459
Call 412-746-5500 Anytime

Item	Code	Price
Global Teleconnect Kit	MC165A	$299.00

Make Clear, Easy, and Fast Connections from Anywhere in the World!

Globe-Trotter Solution Pak

If you're a globe-trotter, this Solution Pak is the *perfect* travel companion. It includes the Global Teleconnect Kit and all its adapters and tools to connect your portable PC for modem links. And it also includes the Megahertz® 56K PC Card for fast connections and even faster analog downloads.

For Megahertz 56K PC Card details, see ***page 399.***

SOLUTION PAK

Item	Code	Price
Globe-Trotter Solution Pak Includes the Global Teleconnect Kit **plus** the Megahertz PC Card	BD1020A	$568.00

MC 125A
TCB-232

Tail-Circuit Buffers (TCBs) • Tail-Circuit Adapter (TCA)

Synchronize Clock Signals in Your Tail Circuit.

- **Use ordinary straight-pinned cables.**
- **Add tail circuits on RS-232, RS-530, RS-422, V.35, or X.21 interfaces.**

Run reliable tail circuits with sync modems—buffers help keep the clocks in sync. Our Tail-Circuit Adapter has a single 16-bit buffer. One RS-232 model (MC125A) supplies 64-bit buffering. All other TCBs provide 512-bit buffers.

Item		Buffering	Code	Price
TCB-232	Female	(512-bit)	MC122A	**$360.00**
TCB-232	Female	(64-bit)	MC125A	**$340.00**
TCA-232	Female	(16-bit)	MC124A	**$275.00**
TCB-530	Female	(512-bit)	MC123A	**$390.00**
TCB-422	Male	(512-bit)	MC126A-M	**$400.00**
	Female	(512-bit)	MC126A-F	**$400.00**
TCB-V.35	Male	(512-bit)	MC127A-M	**$390.00**
	Female	(512-bit)	MC127A	**$400.00**
TCB-X.21	Male	(512-bit)	MC128A-M	**$390.00**
	Female	(512-bit)	MC128A-F	**$390.00**

SPECIFICATIONS

Operation — MC125A: Half- or full-duplex; All others: Full-duplex
Protocol — MC122A, MC124A: Synchronous; All others: Transparent
Speed — MC122A: Up to 72 Kbps; MC124A–MC125A: Up to 256 Kbps; All others: Up to 2.048 Mbps
CE Approval — All items listed are approved
Interface — RS-232, RS-422, RS-530, V.35 (configured as DTE), or X.21
Connectors — MC122A–MC125A: (2) DB25 female; MC126A: (2) DB37 male or female; MC127A: (1) 34-pin female, (1) 34-pin male; MC128A: (2) DB15 male or female
Power — All models: From data and clock signals
Size — 5.3"H x 1.2"W x 2"D (13.5 x 3 x 5 cm)

◆ ◆ ◆

SNA Spoofer

Use Inexpensive Async Devices for High-Speed SNA Communications!

- Run SNA from AS/400® host on low-cost async modems and stat muxes.
- Get two to four times more throughput.
- Configure Spoofer from a local PC.
- Connect Spoofer to the DTE on the SNA side with the DCE/DTE Converter.

SPECIFICATIONS

Protocol — Any SNA/SDLC, including 5250 and 3270
Speed — Up to 38.4 Kbps; SNA: Up to 64 Kbps
CE Approval — 230-VAC version: MT825AE-232
Connectors — DTE: (1) DB25 male with attached 15-ft. (4.6-m) cable for connection to DCE; Terminates with a DB25 female
Power — MT825A-232: Input: 115 VAC; Output: 9 VDC, 300 mA

Item	Code	Price
SNA Spoofer		
RS-232	MT825A-232	**$450.00**
DCE/DTE Converter	MT826	**$25.00**

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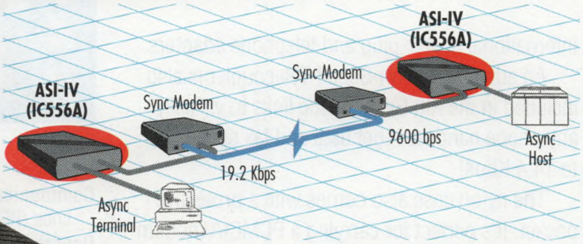
Async to Sync Interface IV • Micro Sync to Async Converter (MSAC)

Link Async Devices with Your Sync Modems and Muxes.

- **Convert async DTE signals for transmission over sync data lines.**
- **Versatility! Two models—powered and nonpowered—handle a range of conversions, dialup or leased lines, and multiple modem standards.**

ASI-NPR
IC942A
ASI-IV
SYNC
ASYNC
RD TD TC RC RD TD PWR
BLACK BOX



These Converters give you a new way to use your sync modems and multiplexors to link your async terminals, printers—even midrange hosts.

Async/Sync Interface IV—Install one of these units on either side of your data line to support half- or full-duplex mode for point-to-point RS-232 applications. It's easy to troubleshoot, too. Run digital loopback tests to check signals. Or use sync bypass to determine the source of problems.

Micro Sync to Async Converter (MSAC)—These nonpowered units draw power from your attached hardware so they don't require a nearby AC outlet. All you need is one pair per circuit. Each performs autobaud adjustment to support DTE speeds from 150 bps to 19.2 Kbps. Character length is switch-selectable from 8 to 11 bits.

Model IC942A is suited to large file transfers. Conversions are done bit by bit—no buffer delay. Model IC932A has an elastic buffer that's ideal for interactive host communications.

SPECIFICATIONS

Async to Sync Interface IV:
Flow Control — User-selectable: Transparent to flow control, or RTS, DTR, RTS, DSR can be constantly ON
Leads Supported — Sync port: 1–8, 15, 17, 20, 23; Async port: 1–8, 20
Maximum Distance — 50 ft. (15.2 m)
Speed — 600 bps to 19.2 Kbps
Connectors — To DTE: (1) DB25 female (async); To DCE: (1) DB25 male (sync)
Power — 115 VAC/60 Hz, 200 mA
Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14 x 21.6 cm)

Micro Sync to Async Converter:
Maximum Distance — 50 ft. (15.2 m)
Operation — Half- or full-duplex
Speed — 150, 300, 600, 1200, 2400, 4800, 9600 bps, and 19.2 Kbps, strap-selectable (port speeds must match)
CE Approval — IC942A
Interface — RS-232
Connectors — IC942A: (2) DB25 male or female; IC932A: (2) DB25 female
Power — From the connected devices
Size — 0.9"H x 1.8"W x 4.7"D (2.3 x 4.6 x 12 cm)

Item	Code	Price
Async/Sync Interface IV	IC556A	**$245.00**
Micro Sync to Async Converter (MSAC)		
Male	IC942A-M	**$255.00**
Female	IC942A-F	**$255.00**
Female with Elastic Buffer (Does Not Include Cable)		
	IC932A	**$255.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.
Specify gender when ordering.

V.Fast Turbo Conditioners

Sweep the Noise from Your Dialup Lines for Maximum Throughput.

- **Condition dialup phone lines in-house without monthly fees from the telephone company.**
- **Your high-speed modems can transmit at their top speeds.**
- **Keep signal frequencies strong over the local loop.**

Your V.34 modem can run at 28.8 Kbps. The basic Sportster® Modem can run up to 33.6 Kbps. But not if your dialup line's noisy.

To really get all the speed your modem can deliver, you need our V.Fast Turbo Conditioners.

These units condition the data line that links your office to the phone company—the local loop—so you get the bandwidth you need to *use* your modem's top speed.

Choose Model 2000 for modem speeds up to 33.6 Kbps. Model 1000 is for modems under 9600 bps. Both support impedance matching, which reduces the reflections electrical signals generate as they travel the local loop.

Each unit also balances the electrical current that flows between sites, lessening the analog "clutter" of ambient line noise.

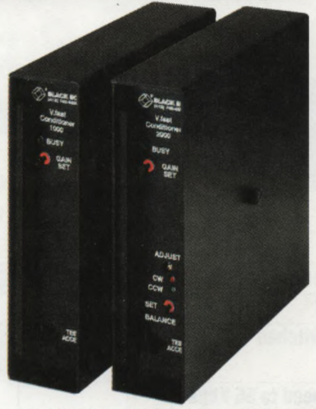
They also increase line quality by reducing circuit loss, keeping signal frequencies strong over the local loop.

V.34+ Modem Speed
With or Without Line Conditioning

WITH	*33.6 Kbps!*
WITHOUT	*14.4 Kbps* —*Or less.*

SPECIFICATIONS

Connectors — (2) RJ-11
Power — From the telephone line
Size — 5.6"H x 1.4"W x 6"D (14.2 x 3.6 x 15 cm)
Weight — 0.6 lb. (0.3 kg)



FAXBACK INFORMATION
Request Document Number: 13095
Call 412-746-5500 Anytime

Item		Code	Price
V.Fast Turbo Conditioner	1000	MC412A	**$399.00**
	2000	MC413A	**$599.00**

* * *

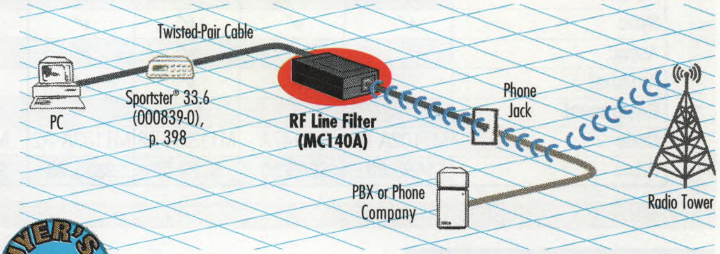
RF Line Filters

Wipe Unwanted Noise from Your Phone Lines.

- **One- and two-line models.**
- **Four frequency options.**

RF interference from nearby power lines or radio towers can cause noise on your phone lines and cripple your modem or fax machine's performance. RF Line Filters are your solutions.

Connect a compact Filter in between your incoming line and your phone, modem, or fax machine to selectively filter out the interference. Models are available for 1- or 2-line phone lines and for a wide range of electrical interference. If you're not sure of the frequency of your interference, please call Tech Support for advice.



The compact RF Line Filter is easy to attach to your phone line.

RF LINE FILTERS

Item	Frequency	Code	Price
RJ-11 (1 Line)	LF (0.5–3 MHz)	MC140A	**$19.95**
	HF (3–30 MHz)	MC141A	**$19.95**
	VHF (26–60 MHz)	MC142A	**$19.95**
	UHF (100 MHz)	MC143A	**$19.95**
RJ-14 (2 Lines)	LF (0.5–3 MHz)	MC144A	**$24.95**
	HF (3–30 MHz)	MC145A	**$24.95**
	VHF (26–60 MHz)	MC146A	**$24.95**
	UHF (100 MHz)	MC147A	**$24.95**

* * *

ModeMiser Abort Timer

Saves Money by Dropping Idle Modem Lines.

- **Drops the line from 45 seconds to 5 minutes after line goes idle.**

The ModeMiser Abort Timer from Black Box monitors the line between your modem and RS-232 device. When data transmission stops in both directions, ModeMiser forces the modem to drop the line so you don't pay for idle phone time. It's perfect for Automatic Teller Machine (ATM) lines, legal services, medical services, and brokerage firms.

SPECIFICATIONS

Flow Control — Transparent
Speed — Transparent to modem speed
Connectors — (1) DB25 female (input), (1) DB25 male
Power — 115-VAC wallmount transformer
Size — 2.3"H x 5"W x 5.3"D (5.8 x 12.7 x 13.5 cm)
Weight — 3 lb. (1.4 kg)

FAXBACK INFORMATION
Request Document Number: 13105
Call 412-746-5500 Anytime

EXCLUSIVE

Set the amount of idle time and start saving on your phone-line charges!

Item	Code	Price
ModeMiser Abort Timer	MC500A	**$249.95**

Putting Your System on DDS or Frame Relay? Black Box CSU/DSUs Are What You Need!

BUYER'S GUIDE

DDS FEATURES COMPARISON CHART

Features	DDS/T1 Super DSU p. 421	DDS CSU/DSU w/SNMP p. 420	CSU/DSU MS p. 421	CSU/DSU SW56 p. 423	CSU/DSU 56/64 p. 421	2-Channel CSU/DSU p. 424	CSU/DSU SDC (V.32 bis) p. 423	CSU/DSU DBU (SW56) p. 422	CSU/DSU MS/DBU p. 422	Micro-CSU/DSU p. 424
Dedicated DDS	✓	✓	✓		✓	✓	✓	✓	✓	✓
T1	✓									
Switched		✓ (4-wire)	✓ (4-wire)	✓ (4-wire)			✓ (4-wire)			✓ (4-wire)
Speed to 56 Kbps		✓	✓	✓			✓	✓	✓	✓
Speed to 64 Kbps	✓		✓	✓	56/64 Kbps only	✓	✓	✓	✓	✓
Autodial Backup							✓ with external DCE	✓ (PSTN)	✓ (SW56)	
Remote Configuration	✓	✓	✓	✓			✓	✓	✓	
SNMP Management	✓	✓								
Sync Data Compression							✓			
V.35	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RS-232	✓		✓	✓		✓	✓	✓	✓	✓
Sync	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Async		✓	✓	✓		✓	✓	✓	✓	✓
Autodial		✓	✓	✓				✓	✓	
Rackmount										✓
Code	MT102A-R2	MT147A	MT132A-R2	MT133A-R2	MT146A	MT148A	MT145A	MT143A	MT134A-R2	MT160A
Price	**$1495.00**	**$995.00**	**$725.00**	**$895.00**	**$345.00**	**$825.00**	**$1495.00**	**$1450.00**	**$1095.00**	**$450.00**

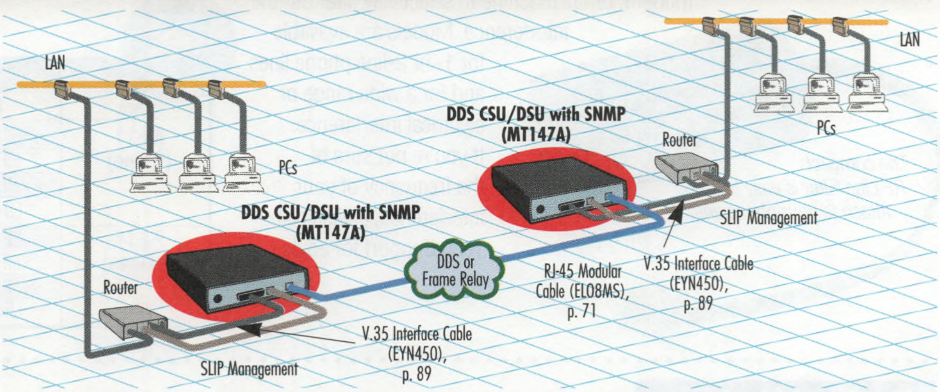
DDS CSU/DSU with SNMP

CSU/DSU Management Made Easy—and Now It's Centralized!

BLACK BOX (412) 746-5500
DDS CSU / DSU-SNMP
POWER
DTE PORT

SPECIFICATIONS

Diagnostics — V.54, DDS, DTE, local-unit and remote-unit loopbacks; internal 511 BERT
Protocol — Sync or async
Interface — V.35, SLIP
Connectors — (1) RJ-48, (1) DB26 Female, (1) RJ-45
Power — 115 VAC, 60 Hz
Size — 2"H x 7.7"W x 10.5"D (5.1 x 19.6 x 27.7 cm)


LAN
PCs
DDS CSU/DSU with SNMP (MT147A)
Router
SLIP Management
V.35 Interface Cable (EYN450), p. 89
DDS or Frame Relay
RJ-45 Modular Cable (EL08MS), p. 71
DDS CSU/DSU with SNMP (MT147A)
Router
SLIP Management
V.35 Interface Cable (EYN450), p. 89
PCs
LAN

- **Built-in SNMP agent for easy management.**
- **SNMP MIB II-compliant.**
- **SLIP interface.**
- **Works over Frame Relay.**

Now you can configure, control, and diagnose your SNMP-compatible devices with this CSU/DSU right from your central LAN management console—and get total network management, too.

FAXBACK INFORMATION
Request Document Number: 14010
Call 412-746-5500 Anytime

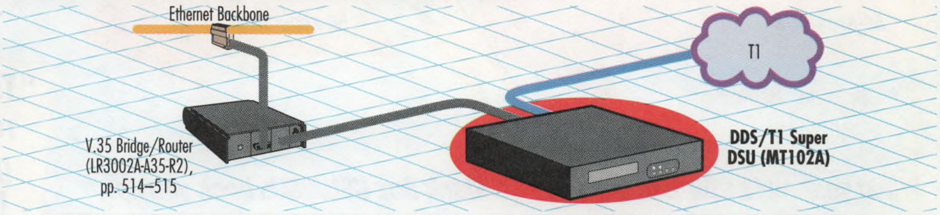
SNMP MIB II compliance makes this unit compatible with popular network management systems like HP® OpenView®. The built-in SLIP interface enables easy connection to existing LAN equipment or via terminal servers.

The 56K unit also supports SW56. It provides easy WAN access to LAN internetworking, CAD/CAM, and videoconferencing equipment.

Item	Code	Price
DDS CSU/DSU with SNMP (56K)	MT147A	**$995.00**
HD26M to M34F Adapter	EHN069-0001-MF	**$45.00**
T1 Non-Span Surge Protector	SP513A-R2	**$79.00**

DDS/T1 Super DSU

Totally Upgradable—Connect to 56-Kbps DDS Now, Upgrade to 1.544-Mbps T1 Later.


Ethernet Backbone
T1
V.35 Bridge/Router (LR3002A-A35-R2), pp. 514–515
DDS/T1 Super DSU (MT102A)

BLACK BOX
DDS/T1 Super DSU
SEL
END
Serial Port
Network

Top: MT102A;
Bottom: MT102A Rear View

SERIAL PORT
NETWORK INTERFACES
T-1
56Kbps-DDS
SNMP
CONSOLE

- **Both a complete 56/64-Kbps DDS CSU/DSU *and* a T1 ESF CSU/DSU.**
- **Complete SNMP management via SLIP connection.**
- **Easy LCD configuration.**
- **Automatic alarm dial-out.**
- **Your *perfect* choice for Frame Relay.**

No matter how large your internetwork grows, the DDS/T1 Super DSU can handle your CSU/DSU needs. Use it for a standard 56-Kbps DDS line now—then when you upgrade, use the same CSU/DSU for your high-speed T1 line. And since you can run your DDS or T1 line into Frame Relay, this CSU/DSU is also the perfect choice for your Frame-Relay connections.

The DDS/T1 Super DSU is completely SNMP manageable—because in today's complex work environments, it's important for *all* your major network devices to be accessible from your SNMP network manager for quick diagnosis and troubleshooting. You can also diagnose and configure the CSU/DSUs for with pushbuttons and an easy-to-read LCD panel or from any ASCII terminal.

For more information on the technologies with DDS/T1 Super DSU, see Black Box Explains SNMP for WAN Management on **page 435** and The Frame-Relay Advantage on **page 524**.

FAXBACK INFORMATION
Request Document Number: 16744
Call 412-746-5500 Anytime

SPECIFICATIONS

Clocking — Internal, frequency locked to network (loop time), frequency locked to serial port (ext)
Diagnostics — Remote and local loopback, test patterns
Management — SNMP MIB II over UDP/IP/SLIP interface
Speed — Up to 64 Kbps or up to 1.544 Mbps
Connectors — 8-Position RJ-48C, DB25 female (M/34 adapter included)
Power — 90–230 VAC, 47–63 Hz, autosensing
Size — 1.8"H x 8.4"W x 10"D (4.6 x 21.3 x 25.4 cm)
Weight — 7 lb. (3.2 kg)

Item	Code	Price
DDS/T1 Super DSU	MT102A-R2	**$1495.00**
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

For other lengths or genders, see p. 89.

CSU/DSU MS

Easy Management and Reliability Make This CSU/DSU a Customer Favorite.

- **2.4- to 64-Kbps service rate.**
- **Secondary async channel—75 to 2400 bps.**
- **DTE-to-loop rate adaptation.**
- **Local or remote configuration.**
- **Automatic or manual dialing.**
- **Auto-answers incoming calls.**

Need a flexible all-rate CSU/DSU for switched or dedicated DDS service? This is it! It handles multiple applications—use it now and down the road if your application changes.

The CSU/DSU MS supports sync *and* async data rates on the primary channel. And a secondary async channel "piggybacks" data over the main sync line.

You can dial on DTR automatically from a bank of stored numbers or manually from the front keypad. The CSU/DSU MS also features an AT-commands dial port and V.25 bis dialing.

Local or remote configuration enables you to respond to system changes when you're not on-site.

SPECIFICATIONS

Diagnostics — DTE, DTE/LOOP, DTE with test pattern, loop only, test pattern
Speed — Up to 64 Kbps sync, up to 57.6 Kbps async
Interface — RS-232, V.35
Connectors — (2) DB25, (1) 34-pin, (1) RJ-48
Size — 2.3"H x 8.8"W x 10.3"D (5.8 x 22.4 x 27.9 cm)

FAXBACK INFORMATION
Request Document Number: 11457
Call 412-746-5500 Anytime

TECH SUPPORT'S PRODUCT OF CHOICE

BLACK BOX
CSU/DSU MS
CANCEL
SHIFT
QUICK
AUXILIARY EIA-232
PRIMARY V.35
PRIMARY EIA-232
TELCO
ON
OFF

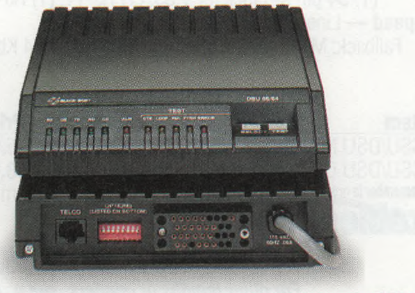
LCD menu configuration makes operation easy. Rate-matching enables you to connect low-speed DTEs.

Item	Code	Price
CSU/DSU MS	MT132A-R2	**$725.00**
T1 Non-Span Surge Protector	SP513A-R2	**$79.00**
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

For other lengths or genders, see p. 89.

CSU/DSU 56/64 Kbps

Your Cost-Effective DDS Line Terminator.



FAXBACK INFORMATION
Request Document Number: 12843
Call 412-746-5500 Anytime

- **V.35 DTE interface.**
- **Synchronous operation at 56 or 64 Kbps.**
- **Point-to-point or multipoint.**

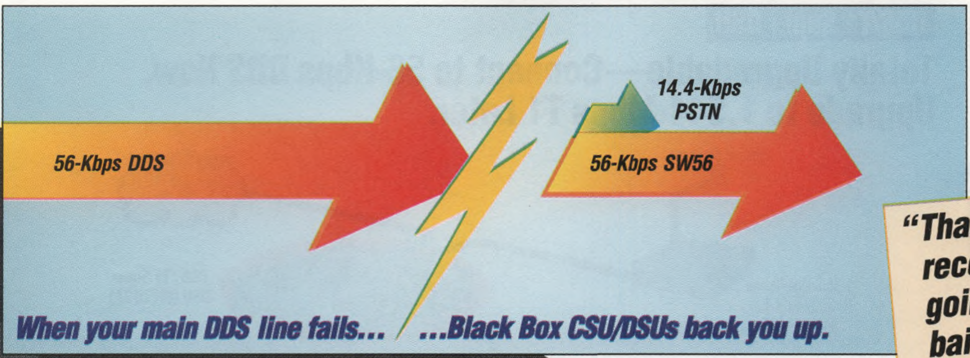
For single point-to-point or multipoint applications, the CSU/DSU 56/64 is the cost-effective solution when you need to terminate 56- or 64-Kbps DDS services. The unit has a V.35 DTE interface, which operates at the same rate as the service. And with its built-in test capabilities, you can troubleshoot your line easily.

SPECIFICATIONS

Diagnostics — Local: DTE, DTE/LOOP, DTE with test pattern, loop only, test pattern; Remote: V.54 with or without 2057 test pattern
Connectors — M/34 Female, RJ-48
Size — 1.6"H x 6.5"W x 8.3"D (4.1 x 16.5 x 21.1 cm)

Item	Code	Price
CSU/DSU 56/64 Kbps	MT146A	**$345.00**
T1 Non-Span Surge Protector	SP513A-R2	**$79.00**
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

For other lengths or genders, see p. 89.


56-Kbps DDS
14.4-Kbps PSTN
56-Kbps SW56
When your main DDS line fails…
…Black Box CSU/DSUs back you up.

> **"Thanks to Black Box for recognizing our dilemma, going the extra mile, and bailing us out. We'll be back!"**

CSU/DSU DBU
RS CS TD RD CD ALM TST

LCD menu management. Remote configuration. V.35 and RS-232 support. Our dial backup CSU/DSUs have it all. And they get your data back in the fast lane—faster than ever.

CSU/DSUs with Dial Backup

Re-Establish Your Data Link *Fast* with Failsafe DDS Backup from Black Box.

DDS lines rarely fail. But when it's *your* mission-critical data left on idle, that service outage takes on a whole new meaning… *catastrophe!*

Without a disaster recovery plan—a backup link—brace yourself for an onslaught of outrage. Dead lines. Dead workstations. Business grinds to a halt.

Even in best-case scenarios, older-style CSU/DSUs with dial backup links rerouted your data at much slower rates than the main line speed of 56 Kbps.

But our CSU/DSUs with high-speed dial backup re-establish your data link faster than ever, speeding your data right back into the fast lane.

CSU/DSU MS/DBU (SW56)—

- **56-Kbps backup for your 56K main line.**
- **You pay for backup only when you use it.**

Choose this unit to route a 56-Kbps fallback connection via Switched 56 DDS. You get the same high speed as with your main line connection.

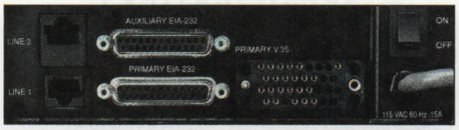
SW56 is a switchable digital service. You pay one low monthly fee for the service, and then a per-minute charge only when you use it. If ISDN isn't available in your area, this CSU/DSU is a great option.

CSU/DSU DBU (V.32 bis)—

- **14.4-Kbps backup via the PSTN.**
- **Low-cost backup alternative to DDS, ISDN.**

The BLACK BOX® CSU/DSU DBU (V.32 bis) model gives you a reliable backup rate over the public switched telephone network.

There are many benefits: no monthly fee for the backup link, an analog escape hatch that hustles data along at 14.4 Kbps over normal phone lines, and your best bet for fast backup where Switched 56 DDS and ISDN aren't available.


AUXILIARY EIA-232
PRIMARY V.35
PRIMARY EIA-232
LINE 2
LINE 1
ON
OFF
115 VAC 60 Hz .15A

All models come with RJ-11, RJ-48, and V.35 connectors PLUS two DB25 connectors for RS-232!

FAXBACK INFORMATION
For MT143A: 13363,
For MT134A-R2: 11457,
Call 412-746-5500 Anytime

SPECIFICATIONS

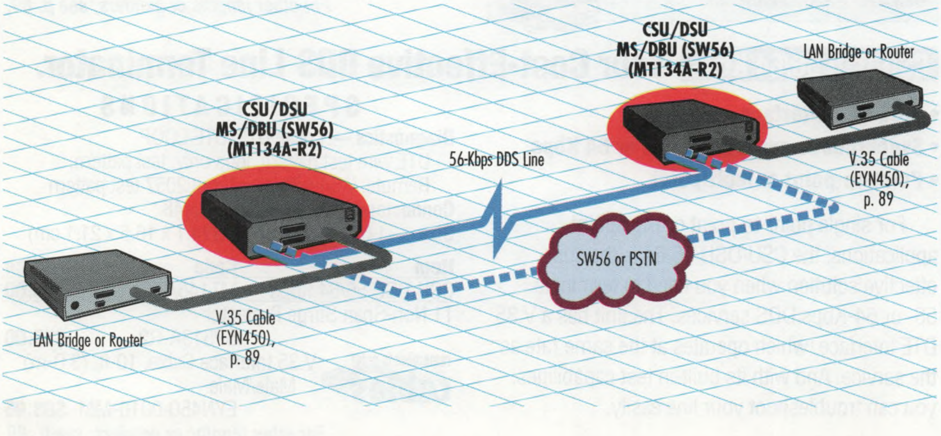
Protocol — Synchronous or asynchronous
Connectors — All models: (2) DB25 for RS-232, (1) 34-pin M-block for V.35, (1) RJ-11, (1) RJ-48
Speed — Line: Up to 64 Kbps; Fallback: MT134A-R2: 56 Kbps; MT143A: 14.4 Kbps

Item	Code	Price
CSU/DSU MS/DBU (SW56)	MT134A-R2	**$1095.00**
CSU/DSU DBU (V.32 bis)	MT143A	**$1450.00**
V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

remember to order cables

For other lengths or genders, see p. 89.

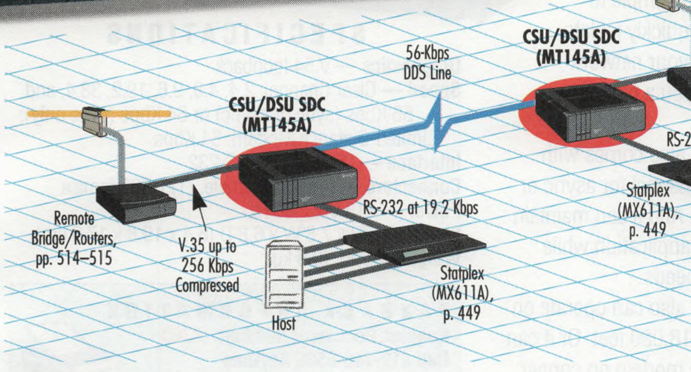
For other lengths, see p. 83.
Specify gender when ordering.


CSU/DSU MS/DBU (SW56) (MT134A-R2)
LAN Bridge or Router
CSU/DSU MS/DBU (SW56) (MT134A-R2)
56-Kbps DDS Line
V.35 Cable (EYN450), p. 89
SW56 or PSTN
LAN Bridge or Router
V.35 Cable (EYN450), p. 89

BLACK BOX
(412) 746-5500
CSU/DSU
SDC

CSU/DSU with Synchronous Data Compression (CSU/DSU SDC)

Now Get up to Four Times More Throughput over DDS Lines!


CSU/DSU SDC (MT145A)
Remote Bridge/Routers, pp. 514–515
56-Kbps DDS Line
CSU/DSU SDC (MT145A)
RS-232 at 19.2 Kbps
Remote Bridge/Routers, pp. 514–515
V.35 up to 256 Kbps Compressed
RS-232 at 19.2 Kbps
Statplex (MX611A), p. 449
Terminals
Host
Statplex (MX611A), p. 449

Use the BLACK BOX® CSU/DSU SDC and expand the bandwidth of your DDS lines. The CSU/DSU SDC provides three DTE ports, one with Synchronous Data Compression (SDC), a sophisticated algorithm for compressing SDLC and HDLC data.

The CSU/DSU SDC is ideal for both LAN and legacy environments. Routers, bridges, and IBM® SNA/SDLC systems can take advantage of the CSU/DSU SDC's bandwidth among the three ports. The two noncompressed ports support sync speeds up to 55.2 Kbps and async speeds up to 19.2 Kbps.

One port can be optioned for automatic line restoration. Upon sensing line failure, the CSU/DSU SDC connects to an external DCE (like an ISDN Terminal Adapter) and restores communication.

The front-panel keypad and LCD display makes configuration and diagnostics quick and easy.

SPECIFICATIONS

Speed — Port 1, Port 2: Synchronous: 1.2, 2.4, 4.8, 7.2, 9.6, 14.4, 16.8, 19.2, 21.6, 24, 28.8, 32, 38.4, 48, 55.2, Asynchronous: 2.4, 4.8, 7.2, 9.6, 14.4, and 19.2 Kbps;
Port 3 (compressed port): 1.2, 2.4, 4.8, 7.2, 9.6, 14.4, 16.8, 19.2, 21.6, 24, 28.8, 32, 38.4, 48, 56, 64, 112, 168, 192, and 256 Kbps

Interface — Port 1, Port 2: RS-232 or V.35;
Port 3 (compressed port): V.35

Connectors — Port 1: DB25 female;
Port 2, Port 3: (2) DB26 subminiature female (adapter cables available for DB25 and V.35)

Power — 115 VAC, 60 Hz

Size — 2.3"H x 6.6"W x 9.6"D (5.8 x 16.8 x 24.4 cm)

- **Synchronous compression ratio up to 4:1.**
- **Built-in line-restoration ("restored") port for fault-tolerant operation.**
- **Provides three user ports for Time-Division Multiplexing (TDM).**
- **Supports DDS-I, DDS-II, and Clear Channel lines.**

FAXBACK INFORMATION
Request Document Number: 13648
Call 412-746-5500 Anytime

Item	Code	Price
CSU/DSU with Synchronous Data Compression (CSU/DSU SDC)	MT145A	**$1495.00**
remember to order cables		
RS-232 DCE-DTE (DB26M/DB25M) 5-ft. (1.5-m)	EHN072-0005-MM	**$45.00**
RS-232 DCE-DTE (DB26M/DB25F) 5-ft. (1.5-m)	EHN072-0005-MF	**$38.00**
RS-232 DCE-DCE (DB26M/DB25M) 3-ft. (0.9-m)	EHN073-0003-MM	**$50.00**
V.35 DCE-DTE (DB26M/M34F) 5-ft. (1.5-m)	EHN074-0005-MF	**$80.00**
V.35 Restoral (DB26M/M34M) 5-ft. (1.5-m)	EHN075-0005-MM	**$60.00**
RS-232 Restoral (DB26M/DB25M) 5-ft. (1.5-m)	EHN076-0005-MM	**$55.00**
T1 Non-Span Surge Protector	SP513A-R2	**$79.00**
Consider ordering a backup Cable and Power Supply…		
Spare RJ-48 Cable, 15-ft. (4.5-m)	EHN077-0015	**$20.00**
Spare Power Supply	PS435	**$210.00**

◆ ◆ ◆

CSU/DSU SW56

Our Flexible Solution for 4-Wire Switched 56 DDS.

- **2.4- to 56-Kbps service rate.**
- **DTE-to-loop rate adaption.**
- **Automatic or manual dialing.**
- **Nonvolatile storage of frequently called numbers.**
- **Auto-answers incoming calls.**

SPECIFICATIONS

Diagnostics — DTE, DTE/LOOP, DTE with test pattern, loop only, test pattern

Speed — Up to 64 Kbps sync, up to 2400 bps async

Interface — RS-232, V.35

Connectors — (2) DB25, (1) 34-pin, (1) RJ-11, (1) RJ-48

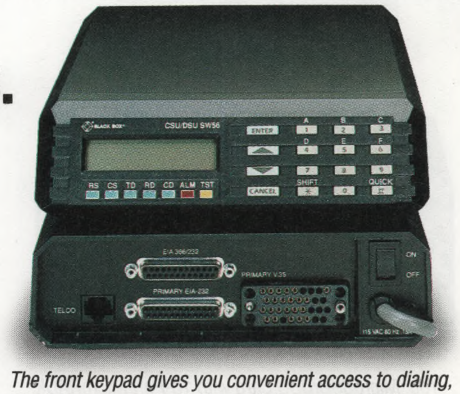
Size — 2.3"H x 8.8"W x 10.3"D (5.8 x 22.4 x 27.9 cm)

If your need for high speed is flexible, Black Box has the perfect solution. When you need a fast link, just dial one. When you're finished working, hang up. You pay a flat monthly fee and usage charges. That's all. This choice is sure to please the bean counters at your organization.

Switched 56 DDS is flexible, too. Call remote sites anywhere. You're not strapped into a single point-to-point link.

Dial on DTR automatically from a bank of stored numbers or manually from the front keypad. The CSU/DSU SW56 features an AT commands dial port and V.25 bis dialing.

With local or remote configuration, you can respond to system changes even if you're not on-site.



The front keypad gives you convenient access to dialing, storing numbers for dialing, and diagnostics. LCD menus make it easy!

Item	Code	Price
CSU/DSU SW56	MT133A-R2	**$895.00**
T1 Non-Span Surge Protector	SP513A-R2	**$79.00**
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

For other lengths or genders, see p. 89.

2-Channel CSU/DSU Get More for Your Money: Run Two Channels over One DDS Line.

- **Split one high-speed DDS line into two independent high-speed subchannels.**
- **Get two digital channels for reliable transmissions—but just pay for one.**
- **Save the cost of an extra DDS line and extra hardware.**
- **Get DTE speed matching.**
- **Isolate network faults to limit downtime.**
- **Multiple interfaces on each channel for async or sync LAN/WAN applications.**
- **Operates on long local loops or as a limited-distance modem.**

Get two high-speed digital channels for the price of one with the BLACK BOX® 2-Channel CSU/DSU.

You get your choice of noise-free Digital Data Service. One subchannel features multirate 2400-bps through 56-Kbps speeds, async or sync. The other subchannel is Clear Channel 64-Kbps. The result—you save the monthly cost of a second DDS line and the cost of extra hardware!

The 2-Channel CSU/DSU supports async/sync DTE speed matching from 300 bps to 57.6 Kbps. And it comes with both V.35 *and* RS-232 interfaces. The user-friendly LCD display shows you extensive management information. Test and Loopback modes are simple to conduct. This CSU/DSU can quickly isolate network faults and minimize your network downtime—and it can save you a bundle in service calls!

The 2-Channel CSU/DSU also comes with multiple interfaces on each channel for async or sync LAN/WAN applications. And it can maintain the desired port speed of an application while giving you higher network speeds.

The 2-Channel CSU/DSU also can operate on long local loops that exceed 18,000 feet. Or it can operate as a limited-distance modem on copper wire—for up to 10 miles—at 56 Kbps!

BLACK BOX
(412) 746-5500
CSU/DSU Two-Channel
Select
Advance
Enter

SPECIFICATIONS

Diagnostics — V.54 loopback

Speed — Clear Channel: 2.4, 4.8, 9.6, 19.2, 38.4, and 56 Kbps (sync or async) or 64 Kbps (sync only); Limited-Distance Modem: 64 Kbps

Interface — (1) V.35, (1) RS-232

Connectors — (1) M/34 female, (1) DB25 female

Power — 115 VAC, 60 Hz

Size — 2.5"H x 7.8"W x 6.8"D (6.4 x 19.8 x 17.3 cm)

Weight — 2 lb. (0.9 kg)

FAXBACK INFORMATION
Request Document Number: 10700
Call 412-746-5500 Anytime

Item	Code	Price
2-Channel CSU/DSU	MT148A	**$825.00**

MicroCSU/DSU Cards Rackmount Your CSU/DSUs and Save Space and Money!

- **Dedicated 4-wire DDS all-rate service (1200 bps to 64 Kbps).**
- **Point-to-point or multipoint, async or sync configuration.**

MORE! MicroRACK Information, see pp. 378–379.

Tuck away up to 16 of these MicroCSU/DSUs in the BLACK BOX® MicroRACK System. Then compare the space *and* the money you're saving. No contest! You've found the perfect economical solution for overcrowded DDS data centers.

The innovative modular design is a real bonus. The Front and Rear Cards fit securely inside the MicroRACK. Consolidate wiring for your entire enterprise in one location. Hot-swap Cards on the fly without shutting down operations. Manage, troubleshoot, re-configure. You can do it all with MicroRACK.

No taller than a cassette tape, each MicroCSU/DSU Card shuttles data along digitally at speeds up to 64 Kbps. Each supports async DTE speeds up to 57.6 Kbps, antistreaming, and V.54 diagnostics. You can also run local or remote loopback tests directly from the front panel of each CSU/DSU. You get the uncompromising performance of bigger, more expensive standalone units but at an affordable price.

Top: MicroCSU/DSU Card with 16-Port MicroRACK. The Rack fits standard 19-inch hardware cabinets. Cards also fit 2-, 4-, or 8-Port Racks (above: top to bottom) for your desktop management center.

SPECIFICATIONS

Diagnostics — V.54, Local/Remote Loopback

Line — Dedicated DDS

CE Approval — MT160A, MT161C-25, SP513A-R2, and 230-VAC version: PS460AE

Interface — RS-232 or V.35

Speed — Up to 57.6 Kbps async; up to 64 Kbps sync

Connectors — MT161C-25: DB25 female; MT161C-V35: M/34 female

Power — From the rack

Item	Code	Price
To add CSU/DSU capabilities to your MicroRACK (pp. 378–379), order as many Front Cards as you need...		
MicroCSU/DSU Front Card	MT160A	**$450.00**
...Then order at least one Rear Card for each Front Card...		
MicroCSU/DSU Rear Card DB25 (Female)	MT161C-25	**$45.00**
MicroCSU/DSU Rear Card V.35 (34-Pin Female)	MT161C-V35	**$45.00**
...Order at least one Power Supply for each MicroRACK...		
AC Power Supply	PS460A	**$140.00**
48-VDC Power Supply	PS461A	**$400.00**
...And you'll need these to connect your MicroRACK...		
CSU/DSU MS (for Remote Site)	MT132A-R2	**$725.00**
T1 Non-Span Surge Protector	SP513A-R2	**$79.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
	For other lengths, see p. 83. Specify gender when ordering.	
V.35 Interface Cable, 10-ft. (3.0-m), Male/Male	EYN450-0010-MM	**$83.95**
	For other lengths or genders, see p. 89.	

FAXBACK INFORMATION
For MicroCSU/DSU Cards: 12850,
For MicroRACKs: 12915
Call 412-746-5500 Anytime

Black Box Has the Right ISDN Equipment for You!

Black Box has the adapters and modems you need to take advantage of ISDN!

With our Hybrid ISDN Terminal Adapter (**page 428**), you can upgrade your system from analog to digital. You get access to ISDN, and you can still communicate with any 14.4-Kbps modem or fax.

The ISDN Data/Voice Modem (**page 427**) gives you high-speed digital connections with analog connectivity—you can simultaneously link analog fax machines, phones, and modems over one ISDN line.

Our ISDN Terminal Adapter 128K (**page 429**) is perfect for bridging and routing applications since it speeds your data at up to 128 Kbps. It's versatile, too, with its connection ports for RS-366 (the connection for most videoconferencing systems), RS-232, RS-530, and V.35. Thanks to its built-in NTU, you get a direct link to ISDN—and you don't need to buy anything else.

Black Box also carries U.S. Robotics® products. For the desktop, we have the popular Courier™ I-Modem (**page 426**)—perfect for Internet access and remote-access applications! And for server access, Black Box has the 8-Port and 16-Port Modem Pool I-Modems (**page 427**). Use them to connect with analog or ISDN devices over ISDN at the highest possible speeds!

Black Box Explains...

The Basics of ISDN.

ISDN stands for **Integrated Services Digital Network**. It's a high-speed digital data service provided by most phone companies. With ISDN you can transmit large amounts of data, voice, and video signals up to 128 Kbps over a single phone line.

With more than 3,000,000 lines active in the U.S., ISDN is now the *fastest-growing* digital communication service in the world. High speed is one reason for its popularity; tumbling tariff rates is another. The average monthly line charge is about $38, but per-minute charges are usually between just five and ten cents!

The most common (and least expensive) ISDN service is **Basic Rate Interface**, or BRI. It's usually used to combine voice and data circuits over one line between small-scale ISDN sites. BRI consists of two 64-Kbps B channels plus a 16-Kbps D channel to support system "overhead" functions such as signaling the telecomm switching system to initiate a call.

What makes ISDN unique is that each B channel is a separate communication circuit. That means just one ISDN line can support *simultaneous two-way communication* for two devices, such as a computer and a telephone or a computer and a video camera for teleconferencing.

If you need to send more data than one 64-Kbps B channel can handle, ISDN also supports **BONDing** for inverse multiplexing. This links the two B channels into a single logical circuit that can support data rates up to 128 Kbps—or up to 512 Kbps with our IMUX 512 (**page 430**)!

ISDN lines are terminated at your location with a special RJ-45 jack. This part of the line is called the **U interface**. And unless you already own U-compatible ISDN phones or PCs, you'll need a **terminal adapter** to make the connection. Refer to the chart **below** to find which one is right for you.

BUYER'S GUIDE

ISDN TERMINAL ADAPTERS

Features	Courier I-Modem IS450V p. 426	MP/8 I-Modem IS460V-8 p. 427	MP/16 I-Modem IS460V-16 p. 427	ISDN Data/ Voice Modem IS415A p. 427	Sportster® ISDN 128K 000904-0 New Product Section	Hybrid TA IS420A p. 428	TA 128K IS280A-R2 p. 429	Dual-Port TA IS260A p. 429	Fallback Adapter IS500A p. 430	IMUX 512 IS520A p. 430
V.35						✓	✓	✓	✓	✓
RS-232	✓	✓	✓	✓		✓	✓	✓	✓	
RS-530							✓			✓
ISA					✓					
POTS Port				2	✓					
Asynchronous	✓	✓	✓	✓		✓	✓	✓	✓	
Synchronous	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RS-366						✓	✓			✓
Dial on DTR	✓	✓	✓	✓		✓	✓	✓		✓
V.25 bis						✓	✓	✓		✓
AT Commands	✓	✓	✓	✓		✓	✓	✓		
Top Async Speed (Kbps)	115.2	115.2	115.2	115.2		115.2	115.2	115.2	57.6	
Sync Speed (Kbps)	128	128	128	128	128	64	128	128	64	512
Built-in NT1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Price	**$399.00**	**$3995.00**	**$7995.00**	**$399.95**	**$229.00**	**$895.00**	**$895.00**	**$895.00**	**$1795.00**	**$2595.00**

Courier I-Modem

The Perfect ISDN Solution:
Download over ISDN at 128 Kbps!
Upgradable for 56-Kbps Analog Downloads!

- **Instantaneous connections.**
- **Talk and send data simultaneously—ideal for collaborating with colleagues or clients.**
- **Works as an ISDN modem or terminal adapter.**
- **Knows when an ISDN or analog connection is made.**
- **128-Kbps ISDN connections, 33.6-Kbps analog connections.**
- **U interface built in, no NT1 required.**
- **Fast, accurate, and reliable. Great for bandwidth-intensive file transfers.**

How about a *really* high-speed modem? If you thought 33.6 Kbps was fast, try your connections at *128 Kbps.*

With the Courier™ I-Modem, you can take full advantage of 128-Kbps ISDN networks. Plus, you can maintain compatibility with an established base of analog applications.

The expansion of mobile communications technology and the rise of bandwidth-intensive file transfers, such as Internet access and LAN-to-LAN connections, have created a demand for faster, more accurate, and reliable transmissions. The Courier I-Modem meets that demand.

And the Courier I-Modem is smart. Send or receive data without worrying about whether someone else's remote device is analog or ISDN. You can even talk and send data simultaneously.

The Courier I-Modem also functions as an ISDN modem or as a terminal adapter. As a modem it works with either ISDN or analog connections. In fact, you get speeds of up to 33.6 Kbps over analog lines. To use it as a terminal adapter, put an ISDN modem on each end for a blazing 128-Kbps connection!

Upgradable
COURIER I-modem with ISDN/V.34

FIVE-YEAR FREE WARRANTY

U.S.Robotics X2

Applications for the Courier I-Modem.

Telecommuting—Establish high-speed connections to your corporate LAN.

Use e-mail, database access, image and graphics transfer—any application that requires the high bandwidth provided by an ISDN connection. And you can get a completely integrated office solution that enables analog equipment such as fax machines, telephones, and answering machines to be connected to the ISDN network.

Internet Access—Internet users can dramatically improve their throughput by using ISDN capabilities for faster file transfer, which is especially important when downloading large graphics files.

File/Imaging Transfers—Send large files or images popular in the medical, insurance, and real estate markets.

SPECIFICATIONS

Central Office Switch Types Supported —
AT&T® 5ESS Custom;
Northern Telecom supported DMS-100;
National ISDN-1 and -2

Fax Standards — V.17, Group III

Maximum Speed — Fax: 14.4 Kbps;
Analog: 33.6 Kbps;
ISDN: 128 Kbps with (2) B channels;
DTE: 230.4 Kbps Async, 128 Kbps sync

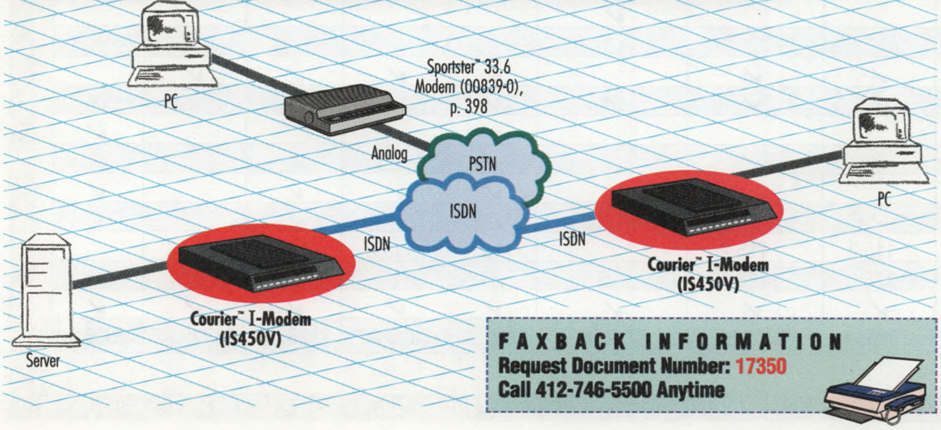
Modem Standards — ITU: V.34+ V.34, V.FC, V.32 terbo, V.32 bis, V.32, V.22 bis, V.22;
Bell: 212A, 103

Protocol — ITU V.120, V.110, PPP

Power — 115 VAC, 60 Hz

Size — 1.3"H x 6.4"W x 10.3"D (3.3 x 16.3 x 26.2 cm)

Mix Analog and ISDN Connections with the Same Modem.


PC
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ISDN
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ISDN
ISDN
Courier™ I-Modem (IS450V)
Courier™ I-Modem (IS450V)
Server

FAXBACK INFORMATION
Request Document Number: 17350
Call 412-746-5500 Anytime

PC Computing BEST

MVP 1996 WINNER PC Computing

Check Out How You Can Save!

The "old" way:

With a 28.8-Kbps modem, monthly line charges are $18.00. Per-minute charges are $0.20. The average 1-MB file takes 347 seconds, or 5.8 minutes, to download. You use your modem 180 minutes a day, and your total monthly cost is $1098.00!

The Black Box Way:

With the Courier I-Modem, monthly line charges are $38.00. But per-minute charges are only $0.10. The same 1-MB file takes only 78 seconds to download! If you use your modem 180 minutes a day, your monthly costs are only $578.00!

**Call NOW—
Save over $520**

Item	Code	Price
Courier I-Modem *(USR Part #000698-0)*		
	IS450V	**$399.00**
RS-232 Cable, 10-ft. (3.0-m)		
	ECM25C-0010	**$23.95**

remember to order cables

For other lengths, see p. 83.
Specify gender when ordering.

Modem Pool I-Modems

Make Transparent ISDN or Analog Connections.

- **Speedy! 33.6-Kbps analog or 64-Kbps ISDN.**
- **Transparent connections to ISDN or analog services.**
- **Connect with analog or ISDN devices over ISDN at the highest possible speed.**

One way or another the data must go through. And with the Modem Pool I-Modems, data goes through up to 33.6 Kbps analog or 64 Kbps ISDN!

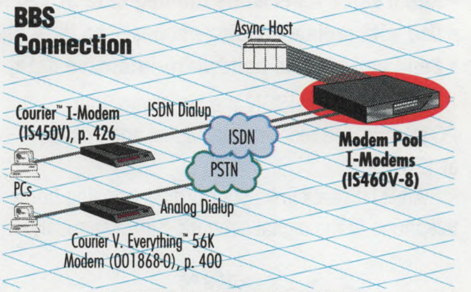
I-Modems add high-bandwidth ISDN/analog access to current dialup networks. Use them with terminal servers, routers, asynchronous hosts, or racked PCs—so remote users can dial the same number for high-speed analog or ISDN access! Dial-out users can also transparently connect to ISDN or analog services.

Universal Connect™ technology means users can connect with analog modems, 56-Kbps DSUs, terminal adapters, or other ISDN devices over an ISDN connection at the highest possible speed.

U.S.Robotics® X TECHNOLOGY

Upgradable

U.S.Robotics
TOTAL CONTROL™
MP/8 I-modem


BBS Connection
Async Host
Courier™ I-Modem (IS450V), p. 426
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ISDN
PSTN
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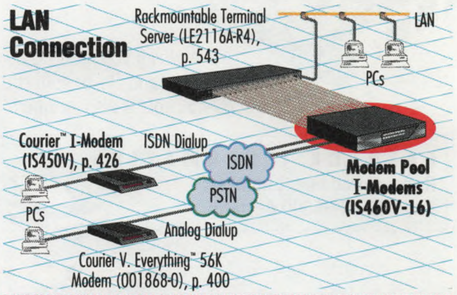
Analog Dialup
Courier V. Everything™ 56K Modem (001868-0), p. 400


LAN Connection
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ISDN
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Analog Dialup
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SPECIFICATIONS

Analog Data Compatibility — ITU: V.34, V.FC, V.32 terbo, V.32 bis, V.32, V.22 bis, V.22; Bell: 212A and Bell 103; Fax: V.17, Group III

Compression — V.42 bis and MNP® 5

Error Correction — V.42 and MNP 2–4

ISDN Compatibility — AT&T® 5ESS Custom, Northern Telecom® DMS-100, National ISDN-1 and -2

ISDN Interface — 8 or 16 B channels, U interface

Size — 3.5"H x 17.5"W x 12.6"D (8.9 x 44.5 x 32 cm)

FAXBACK INFORMATION
Request Document Number: 17886
Call 412-746-5500 Anytime

Item	Code	Price
Modem Pool/8 I-Modem	IS460V-8	**$3995.00**
/16 I-Modem	IS460V-16	**$7995.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010-MF	**$23.95**

For other lengths, see p. 83.
Specify gender when ordering.

◆ ◆ ◆

ISDN Data/Voice Modem

Connect Your Office to High-Speed ISDN!

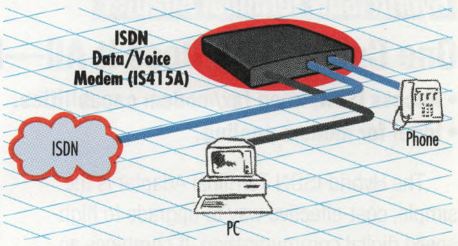
- **High speed for your office communications.**
- **Uses any combination of two analog devices over a single basic-rate ISDN line.**
- **Does simultaneous voice and data calls.**
- **Windows 95 compatible.**

Plug your analog devices into the power of ISDN—and get all the office communication features you need—with Black Box's ISDN Data/Voice Modem.

The Data/Voice Modem is a high-speed terminal adapter for your home and office. It provides a 115-Kbps connection to your serial port. It includes two POTS (plain old telephone service) ports so you can jack in any combination of two analog devices—two phones, or one phone and one fax, or one phone and one modem.

And you get versatility, too! You can transmit and receive data on your computer, or talk on the phone and send or receive faxes—all at the same time—over a single basic-rate ISDN line. Now that's professional high-speed power—and a money saver—for all your office communication! The BLACK BOX® ISDN Data/Voice Modem is also compatible with Windows® 95.

FAXBACK INFORMATION
Request Document Number: 13057
Call 412-746-5500 Anytime


ISDN Data/Voice Modem (IS415A)
ISDN
Phone
PC

SPECIFICATIONS

B-Channel Protocol — V.120; PPP (point-to-point protocol): Multilink PPP, Async Inverse Multiplexing (AIMux); BONDING

Command Set — Hayes® AT compatible; V.25 bis

ISDN Interface — U interface

ISDN Standards — National ISDN-1, Northern Telecom DMS 100, AT&T 5ESS central office switches

Line Requirements — Requires an ISDN Basic Rate line (order from your telephone company)

Serial Port Requirements — Computer serial ports with a 16550 UART or equivalent high-speed serial cards are recommended

Software Requirements — Microsoft Windows 3.1 or higher

Speed — 300 bps to 115.2 Kbps async, 1200 bps to 128 Kbps sync

Interface — Standard EIA-232E: ITU V.24, POTS

Connectors — (1) DB25 female, (2) standard RJ-11 jacks for analog devices

Size — 1.5"H x 6.4"W x 5.3"D (3.8 x 16.3 x 13.5 cm)

Weight — 0.7 lb. (0.3 kg)

Item	Code	Price
ISDN Data/Voice Modem	IS415A	**$399.95**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010-MF	**$23.95**

For other lengths, see p. 83.
Specify gender when ordering.

BLACK BOX (412) 746-5500
ISDN TA PRO
VS
DS
CS
TR
RD
TD
High-Speed Versatility!

NEW LOW PRICE $ • NEW LOW PRICE $ • NEW LOW PRICE $

VIPreview
Ask for our **ISDN VIPreview.**

BLACK BOX
ISDN Driver 1.02 for Windows NT (i386)
Disk 1 of 1 Install
Disk 2 of 2
Disk 1 of 2
HD

Everything you need: An ISDN Card and Driver software. An RJ-45 cable is also included.

ISDN PC Adapter Card-128

Connect a Fast ISDN Line Right to Your PC!

The Ideal Solution for Remote LAN/Internet Access.

- **Works with all popular software: NetWare®, VINES™, Windows® for Workgroups, and more. Includes NDIS, ODI™ (for IPX™, Packet Driver, and TAPI interfaces).**
- **Make voice calls while running data at 128 Kbps.**
- **Use with ordinary analog phones—no ISDN phones required. Connect fax machines, too.**
- **Send and receive bandwidth-intensive data, video, and images that plain modems can't!**

FAXBACK INFORMATION
Request Document Number: 13961
Call 412-746-5500 Anytime

Connect a fast ISDN line directly to your PC to send and receive data, video, and images at 128 Kbps!

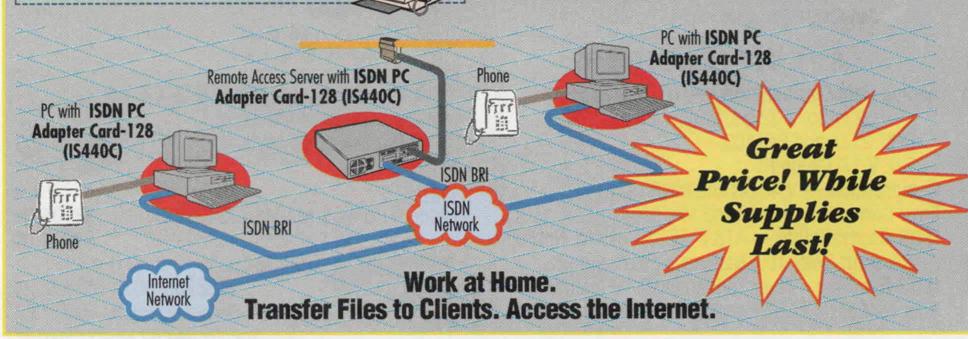
An RJ-11 jack links your ordinary analog home telephone to the digital network. Simultaneously use the phone line for voice and data. Even connect a fax machine.

Multiple driver supports make this Card compatible with all major operating systems and software packages.

SPECIFICATIONS

Speed — Up to 128 Kbps
System Requirements — ISDN BRI phone line (available through local phone company); PC 386 or higher, 4-MB RAM, DOS 5.0 or higher
Connectors — (1) RJ-11, (1) RJ-45, (1) 4-pin mini DIN
Size — 0.6"H x 4.3"W x 8"D (1.5 x 10.9 x 20.3 cm)
Weight — 2.5 lb. (1.1 kg)

Item	Code	Was	NOW!
ISDN PC Adapter Card-128	IS440C	~~$649.00~~	$249.00


PC with ISDN PC Adapter Card-128 (IS440C)
Remote Access Server with ISDN PC Adapter Card-128 (IS440C)
Phone
PC with ISDN PC Adapter Card-128 (IS440C)
Phone
ISDN BRI
ISDN Network
ISDN BRI
Internet Network
Great Price! While Supplies Last!

Work at Home.
Transfer Files to Clients. Access the Internet.

Hybrid ISDN Terminal Adapter

One Connection Does It All—ISDN, V.32 bis, and Fax.

- **Access ISDN, keep fax/modem capabilities.**
- **Ideal for modem pooling.**
- **Supports sync, async, RS-232, RS-366, and V.35 interfaces.**

The Hybrid ISDN Terminal Adapter is the simple, cost-effective way to upgrade to high-speed digital communication. It combines an ISDN terminal adapter, a 14.4-Kbps modem (V.32 bis), and a Group III fax. Access emerging ISDN services and still communicate with any V.32 bis modem or fax.

The Adapter automatically determines incoming ISDN or modem calls and connects you instantly. It's ideal in modem-pooling applications where both ISDN and analog are necessary.

SPECIFICATIONS

Compression — MNP® Level 5, ITU V.42 bis
ISDN Compatibility — National ISDN-1 (NI-1), AT&T 5ESS, Northern Telecom DMS-100
Rate Adaption — ITU V.120, clear channel
Speed — ISDN: Sync: Up to 64 Kbps; Async: Up to 115 Kbps; Analog: 19.2 Kbps
Interface — ISDN: Basic rate service (2B + D); Data Terminal: RS-232, V.35, and RS-366
Connectors — (2) DB25 female, 34-pin M-block, RJ-45 female
Power — 115 VAC, 60 Hz, 3 watts
Size — 1.5"H x 6.4"W x 5.3"D (3.8 x 16.3 x 13.5 cm)

FAXBACK INFORMATION
Request Document Number: 13064
Call 412-746-5500 Anytime

Item	Code	Price
Hybrid ISDN Terminal Adapter (V.32 bis)	IS420A	$895.00
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	$23.95
For other lengths, see p. 83. *Specify gender when ordering.*		
V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	$83.95
For other lengths or genders, see p. 89.		

Network Termination Unit-1 (NTU-1)

Make a Connection between Your ISDN Line and Equipment.

- **Supports distances up to 3.4 miles (5.5 km).**
- **Power supply now included.**

The NTU-1 provides the interface between your ISDN line and your premise ISDN equipment (S or T interface). NTU-1 supports point-to-point and multipoint configurations, and distances up to 18,000 feet over 26 AWG cable. An AC power supply is included.

BLACK BOX (412) 746-5500
NTU-1
ISDN

SPECIFICATIONS

Line Type — Basic rate ISDN (2B1Q)
Switch Compatibility — AT&T, NT, Siemens®, GTE®
Connectors — (3) RJ-45
Indicators — (6) LEDs: Network, Test, Error, Ready, Local Error, Power
Power — 120-VAC, 60-Hz external supply
Size — 1.4"H x 6.3"W x 3.8"D (3.6 x 16 x 9.7 cm)

FAXBACK INFORMATION
Request Document Number: 11512
Call 412-746-5500 Anytime

Item	Code	Price
Network Termination Unit-1	IS200A-R2	$225.00

ISDN Terminal Adapter 128K

Run Your Data at 128 Kbps with ISDN.

- **Inverse multiplexing maximizes ISDN throughput rates to 128 Kbps.**
- **Supports front-panel keypad, V.25 bis, AT commands, dial-on-DTR, and RS-366 dialing.**
- **Built-in NTU makes the direct link to ISDN. No separate components to buy.**

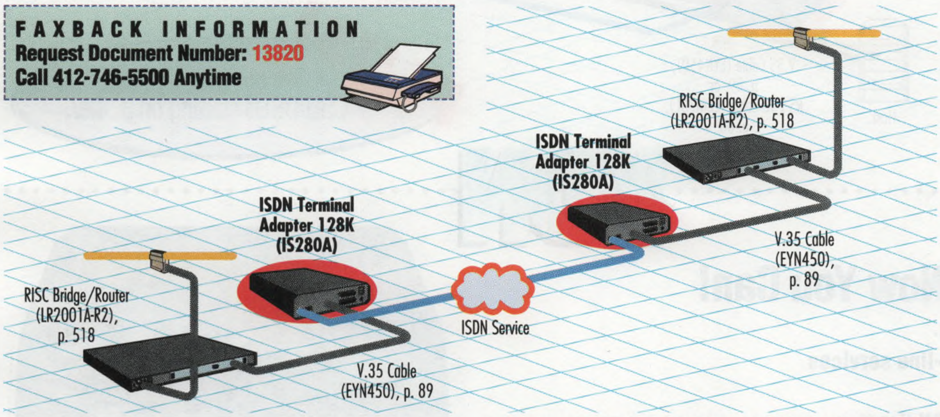
Think of it as a high-speed dial modem for ISDN. The TA 128K packs all the perks of a full-featured ISDN Terminal Adapter: front-panel LCD menu configuration and diagnostics, support for sync and async data. But what really sets it apart is inverse multiplexing.

In high-speed applications such as bridging and routing, the TA 128K supports 128 Kbps on a single port (over both B channels) using the "BONDING" standard. Your network gets high-speed bandwidth-on-demand capability. The TA 128K can communicate with Switched 56K services and use the V.120 rate-adaption standard, so there's no problem communicating with sites that don't have ISDN service.

Dialing options to support any application.

The TA 128K accommodates many different dialing standards. The RS-366 dialing port matches with most videoconferencing systems. Dial-on-DTR is compatible with bridges and routers with bandwidth-on-demand features. V.25 bis in-band dialing supports IBM® SNA systems like mainframes and the AS/400®. PCs can use standard communication packages like ProComm® and Winfax® since the TA 128K has AT Command Set compatibility. Manual dialing, of course, is supported via a standard number or the built-in keypad.

FAXBACK INFORMATION
Request Document Number: 13820
Call 412-746-5500 Anytime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ISDN Terminal Adapter 128K (IS280A)
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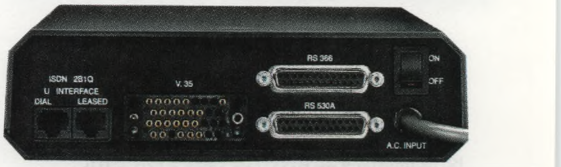
BLACK BOX
ISDN TA 128K
RS CS TD RD CD TR SR
ENTER
CANCEL


ISDN 2B1Q
U INTERFACE
DIAL LEASED
V.35
RS 366
RS 530A
ON
OFF
A.C. INPUT

Our TA 128K has ports for RS-366, RS-232, RS-530, and V.35 connections. It's versatile for a wide range of mainframe and wide-area-networking applications.

SPECIFICATIONS

Protocol — DTE: Async and sync; BRI: 2B1Q
Speed — Async to 115.2 Kbps; Sync to 128 Kbps
Standards — ITU: V.120, T-Link; Northern Telecom®: DMS-100, AT&T® 5ESS central office switches
Interface — RS-530 or V.35, RS-366, RS-232
Connectors — (2) DB25 female, (1) RJ-45, (1) V.35 female
Power — 115 VAC, 60 Hz
Size — 2.3"H x 8.8"W x 11"D (5.8 x 22.4 x 27.9 cm)
Weight — 3 lb. (1.4 kg)

Item	Code	Price
ISDN Terminal Adapter 128K	IS280A-R2	**$895.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83. Specify gender when ordering.		
V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**
For other lengths or genders, see p. 89.		

Dual-Port Terminal Adapter

Connect Two Devices to ISDN with One Terminal Adapter.

- **Provides two 64-Kbps data channels.**
- **No need to buy a separate NT1 unit— the U interface is built in.**
- **Supports RS-232 and V.35 interfaces.**

The Dual-Port Terminal Adapter provides connection of computer devices to ISDN basic-rate services. You can connect up to two PCs, terminals, routers, or other devices.

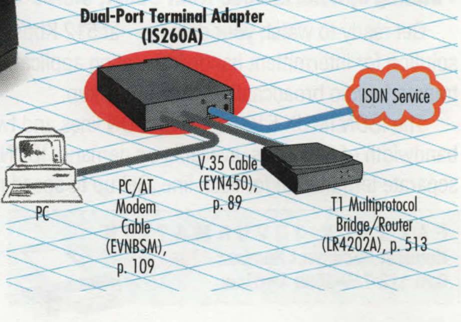
Each port can be configured as either RS-232 or V.35, sync or async. Then each attached device can transmit data simultaneously at speeds up to 64 Kbps, or separately at speeds up to 128 Kbps, using "BONDING."

The D channel supports X.25 packet-switching protocol. The front-panel keypad and LCD screens make configuration and dialing a breeze.

FAXBACK INFORMATION
Request Document Number: 13552
Call 412-746-5500 Anytime

SPECIFICATIONS

Protocol — DTE: Asynchronous and synchronous; BRI: 2B1Q
Speed — Async: up to 115.2 Kbps; Sync: up to 128 Kbps
Standards — AT&T® 5ESS central office switch; Northern Telecom® DMS-100 central office switch
Interface — RS-232, V.35
Connectors — (1) RJ-45C (ST® interface), (1) DB25 female
Power — 115 VAC, 60 Hz
Size — 2.5"H x 9.6"W x 7"D (6.4 x 24.4 x 17.8 cm)
Weight — 5 lb. (2.3 kg)


Dual-Port Terminal Adapter (IS260A)
ISDN Service
V.35 Cable (EYN450), p. 89
PC
PC/AT Modem Cable (EVNBSM), p. 109
T1 Multiprotocol Bridge/Router (LR4202A), p. 513

Item	Code	Price
Dual-Port Terminal Adapter	IS260A	**$895.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83. Specify gender when ordering.		
V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**
For other lengths or genders, see p. 89.		

ISDN Fallback Adapter

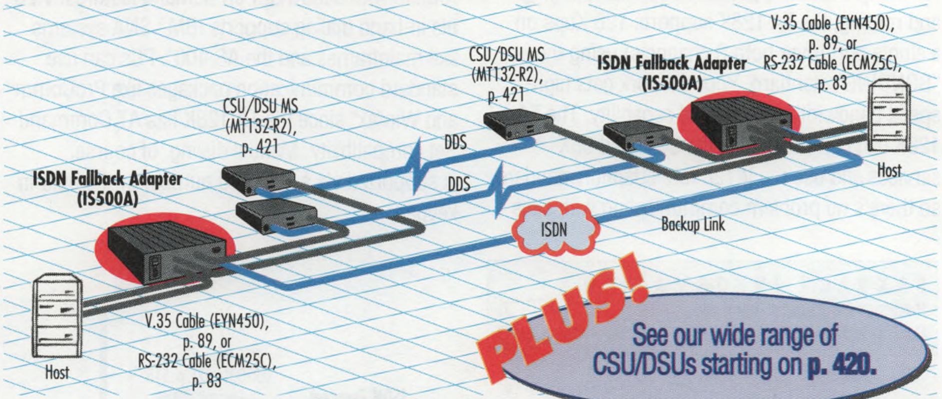
Get Automatic Backup for Two DDS Lines—with ISDN.

- **Backs up two DDS lines with dialup ISDN.**
- **Automatically switches to ISDN when DDS fails.**
- **Works with your existing CSU/DSUs.**
- **User-configurable from front-panel keypad.**

FAXBACK INFORMATION
Request Document Number: 13394
Call 412-746-5500 Anytime

With the BLACK BOX® ISDN Fallback Adapter, you can back up two DDS lines with a single dialup ISDN line at full speed—64 Kbps over two digital channels. You don't pay for a third DDS line, only for the ISDN. And remember these are designed to work in pairs.

To install the Adapter, simply connect it via either its RS-232 or its V.35 DTE interface. Then use the front-panel controls to set Fallback and Restore criteria. A terminal adapter is built in, but you can also use the Fallback Adapter to make a temporary link to a remote terminal adapter.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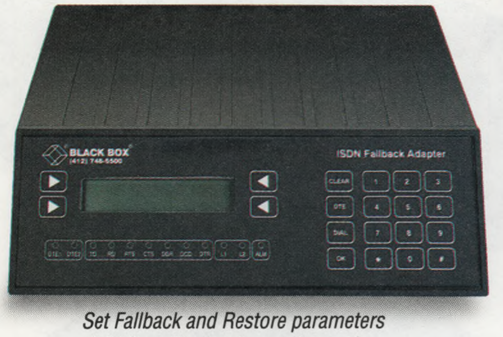
CSU/DSU MS
(MT132-R2),
p. 421
ISDN Fallback Adapter
(IS500A)
CSU/DSU MS
(MT132-R2),
p. 421
DDS
DDS
Host
ISDN Fallback Adapter
(IS500A)
ISDN
Backup Link
Host
V.35 Cable (EYN450),
p. 89, or
RS-232 Cable (ECM25C),
p. 83

PLUS! See our wide range of CSU/DSUs starting on **p. 420.**



Set Fallback and Restore parameters right from the front-panel keypad.

SPECIFICATIONS

CSU/DSU Interface — RS-232 or V.35
ISDN Interface — Basic rate service (2B + 1D), U Interface
Network Termination — NT1 and NT2
Rate Adaption — V.120 and Clear Channel
Speed — Sync: To 128 Kbps; Async: To 57.6 Kbps
Connectors — (4) DB25 female, (1) RJ-45 female
Power — 115 VAC, 60 Hz
Size — 2.3"H x 7.6"W x 11"D (5.8 x 19.3 x 27.9 cm)
Weight — 5 lb. (2.3 kg)

Item	Code	Price
ISDN Fallback Adapter	IS500A	**$1795.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.

ISDN

ISDN IMUX 512

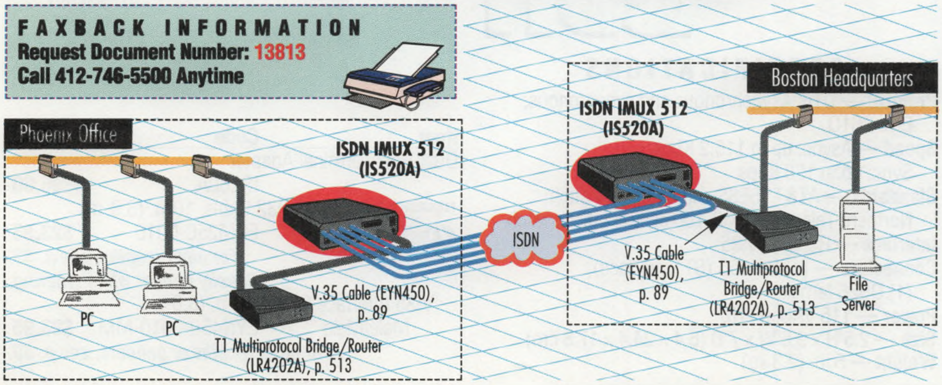
Run ISDN up to 512 Kbps? Now You Can!

- **Each unit supports one high-speed data circuit.**
- **Ideal solution for backing up top-speed leased-line services for router or videoconferencing applications.**
- **Performs inverse multiplexing for up to four ISDN lines.**
- **Low-cost alternative to expensive inverse multiplexors.**
- **Supports V.35 and RS-530 data interfaces.**
- **Dialing options include front-panel, stored-number, V.25 bis, DTR dialing, and an RS-366 port.**

Get ready to watch your data fly—at 512 Kbps. The BLACK BOX® ISDN IMUX 512 is your low-cost solution for intermittent bandwidth-eating applications like videoconferencing, LAN/WAN, high-speed file transfer, audio broadcasting, and T1 backup.

The ISDN IMUX 512 uses two ISDN lines and two 64-Kbps backup channels to create a composite bandwidth of 512 Kbps, available on demand. ISDN termination is built-in, saving you the expense of separate termination for each line. Get up to speed now with the ISDN IMUX 512.

FAXBACK INFORMATION
Request Document Number: 13813
Call 412-746-5500 Anytime


Phoenix Office
ISDN IMUX 512
(IS520A)
PC
PC
V.35 Cable (EYN450),
p. 89
T1 Multiprotocol Bridge/Router
(LR4202A), p. 513
ISDN
Boston Headquarters
ISDN IMUX 512
(IS520A)
V.35 Cable
(EYN450),
p. 89
T1 Multiprotocol
Bridge/Router
(LR4202A), p. 513
File
Server

SPECIFICATIONS

CSU/DSU Interface — RS-530 or V.35
Diagnostics — Local and remote loopbacks, V.54 loopback, 2047 pattern
ISDN Interface — 2B1Q Basic rate service, U Interface
Network Termination — NT1 and NT2
Speed — 56 to 512 Kbps, sync
Connectors — (2) DB25 female, (1) 34-pin, (6) RJ-45 female
Power — 115 VAC, 60 Hz, 8 watts maximum
Size — 2.3"H x 8.8"W x 11"D (5.8 x 22.2 x 27.9 cm)
Weight — 3 lb. (1.4 kg)

Item	Code	Price
ISDN IMUX 512	IS520A	**$2595.00**
remember to order cables ***For dual-port videoconferencing, you may also need:***		
RS-530 to V.35 Adapter Cable	EHN500	**$60.00**
RS-366 Y-Cable	EHN501	**$36.00**

T1 and E1—for Top Speed *and* Versatility.

Move Lots of Data—*FAST*—and Save Money While You're at It.

That's the challenge you face as a network administrator, especially these days, as hybrid voice/data/LAN systems proliferate and you're faced with linking more and more locations, farther and farther apart.

But if your job is to blend far-flung, high-speed data circuits into a seamless, reliable infrastructure—*affordably*—the experts at Black Box have your solutions: **T1 and E1**.

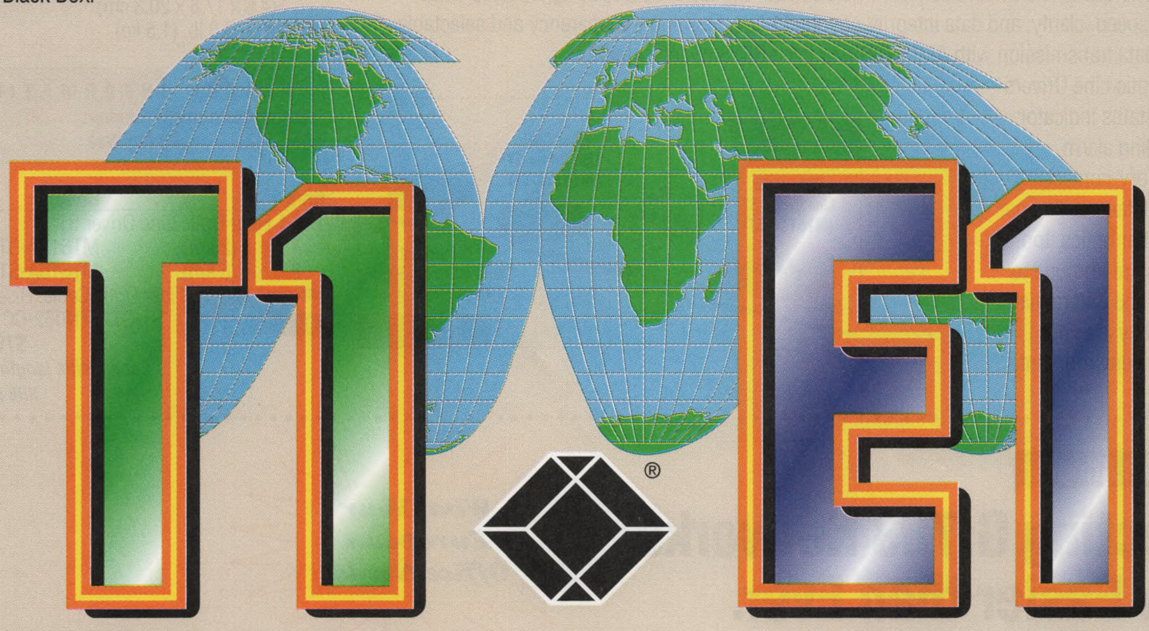
Depending on where your network's located and where your data's headed, T1 and E1 digital data services can provide the wide-bandwidth pipeline you need to send voice, fax, LAN, video—any kind of data—anywhere you need it. Economically!

And as the worldwide demand for such information becomes more widespread and urgent, no other equipment provider is ready to help you like Black Box.

Black Box Is a *Global Supplier* of T1 and E1 Solutions. We Offer:

- 10 years' experience helping customers implement real-world T1 and E1 solutions: worldwide! With offices in 77 countries, Black Box can help provide the "local insight" you need to develop communication systems anywhere on earth.
- The complete line of T1 and E1 solutions for WANs, router links, Frame Relay, Internet connections, voice/data integration, videoconferencing, and more!
- Best of all, you can count on Black Box for the industry's best expert Technical Support, FREE, 24 hours a day, whenever you need us.

So Call Black Box Today to Start Communicating Faster than Ever!



Black Box Explains...

The Benefits of T1 and E1.

If you manage a heavy-traffic data network and you demand high bandwidth for high speeds, Black Box has what you need to send your data digitally over superfast T1 or E1 communication lines.

Both T1 and E1 are foundations of global voice communication.

Developed more than 30 years ago, and commercially available since 1983, T1 and E1 go virtually anywhere phone lines go, but faster. T1 sends data up to 1.544 Mbps. E1 supports speeds to 2.048 Mbps. No matter where you need to connect—North, South, or Central America, Europe, or the Pacific Rim—T1 and E1 can get your data there—*fast!*

Both services provide flexibility for a multitude of applications.

Whether you need to drive a private, point-to-point line or a high-speed circuit, provide corporate access to the Internet or inbound access to your own web server, or support a voice/data/fax/video WAN that extends halfway around the world, T1 or E1 can make the connection.

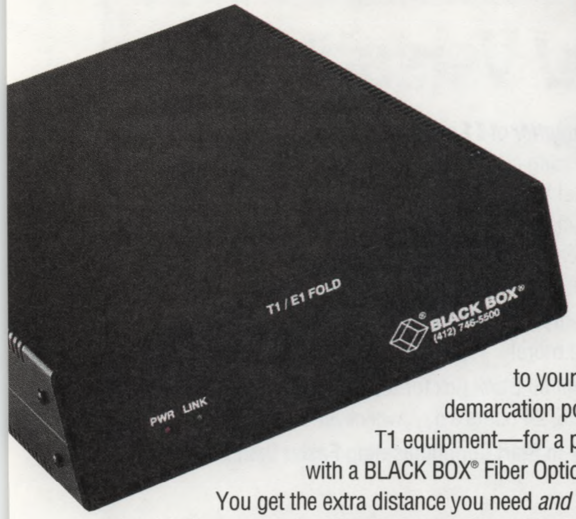
Both offer cost-effective connections.

In recent years, competition among telco service providers has led to increasingly more affordable prices for T1 and E1 services. In fact, most companies seriously considering a shift to T1 or E1 will find that they can negotiate even better rates with just a little comparative cost analysis.

Typical applications:

- Accessing public Frame-Relay networks or public switched telephone networks for voice and fax.
- Merging voice and data traffic. A single T1 or E1 line can give you several additional voice and data lines at no additional cost.
- Making LAN connections. If you're linking LANs, a T1 or E1 line offers excellent performance.
- Sending bandwidth-intensive data such as CAD/CAM, MRI, CAT-scan images, and other graphics with large files.

Turn the page for more great T1 and E1 solutions!



T1/E1 Fiber Optic Line Driver ST

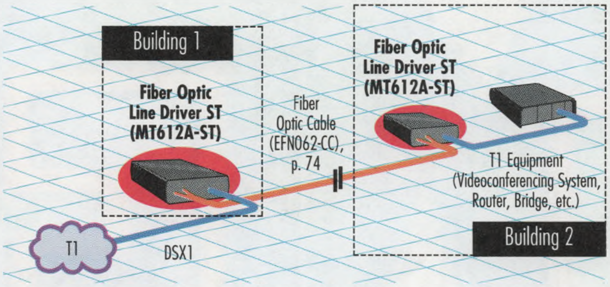
Extend T1 Lines from Demarcation All the Way to Your Equipment.

- **Support distances to 1.2 or 3.1 miles.**
- **Convert T1/E1 signals to fiberoptic pulses.**
- **High speed with fiberoptic security.**

The telephone company brings a T1 line to your building and terminates it. That's called the demarcation point. They will extend the line from there to your T1 equipment—for a price. Or you can do it yourself and save money—with a BLACK BOX® Fiber Optic Line Driver.

You get the extra distance you need *and* immunity to electrical noise and surges—only with fiberoptic cable. The Drivers convert T1's electrical signals to fiberoptic light pulses while maintaining the speed, clarity, and data integrity of your T1 line. Framing transparency and selectable options enable data transmission with AMI, HDB3, or even B8ZS coded signals.

Both Fiber Optic Line Drivers feature an LED status indicator, all-"ones" signaling alarm generation, and dry-contact closure upon link failure. You get the security of fiber optics, too. The Line Drivers are immune to EMI/RFI, spikes and differential ground loops. They are your secure link in any environment.


Building 1
Fiber Optic Line Driver ST (MT612A-ST)
Fiber Optic Cable (EFN062-CC), p. 74
Fiber Optic Line Driver ST (MT612A-ST)
T1 Equipment (Videoconferencing System, Router, Bridge, etc.)
Building 2
T1
DSX1

SPECIFICATIONS

Operating Wavelength — MT612A-ST: 820 mm; MT610A-ST: 1300 mm
Speed — T1 (1.544 Mbps) or E1 (2.048 Mbps)
CE Approval — 230-VAC version: (MT610AE-ST)
Interface — DSX-1, G.703 balanced or unbalanced, 75, 100, or 120 ohms, jumper-selectable
Connectors — (1) DB15 female, (2) BNC, (2) ST®
Indicators — (2) LEDs: (1) power, (1) signal loss
Power — 115 VAC, 60 Hz, 5 watts (230-VAC, 50-Hz version on request)
Size — MT612A-ST: 1.5"H x 6.5"W x 8.5"D (3.8 x 16.5 x 21.6 cm); MT610A-ST: 1.8"H x 7"W x 8"D (4.6 x 17.8 x 20.3 cm)
Weight — 3.3 lb. (1.5 kg)

FAXBACK INFORMATION
Request Document Number: 11835
Call 412-746-5500 Anytime

Item	Code	Price
T1/E1 Fiber Optic Line Driver ST		
1.2 mi. (2 km)	MT612A-ST	**$795.00**
3.1 mi. (5 km)	MT610A-ST	**$2000.00**
Fiber Optic Cable, Riser ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

remember to order cables

For specific lengths or bulk cable, see pp. 74 and 118.

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G.703 75-120 Adapter

Connecting G.703 Networks Is Now Easier than Ever.

What Your European Office Needs!

- **Converts between G.703 balanced and unbalanced interfaces.**
- **Make 75-ohm (dual-coax) and 120-ohm (twisted-pair) network connections.**

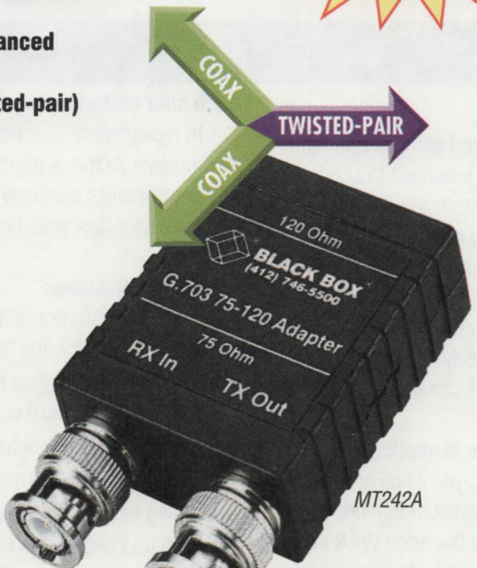
Looking for a solution to connect your bridges and routers from a balanced G.703 interface to an unbalanced G.703 interface?

Black Box has it—the G.703 75–120 Adapter!

Our handy little G.703 Adapter provides proper impedance matching and enables 75-ohm coax hardware to communicate with 120-ohm twisted-pair equipment.

The Adapter comes in Male or Female versions to best match your networking needs.

PLUS! G.703 Codirectional Converter, **see p. 327.**



MT242A

SPECIFICATIONS

Maximum Speed — 2.048 Mbps
CE Approval — All items listed are approved
Interface — A: G.703 unbalanced; B: G.703 balanced
Connectors — MT242A-M: Interface A: Dual-coax BNC male; Interface B: 8-pin shielded RJ-45; MT242A-F: Interface A: Dual-coax BNC female; Interface B: 9-pin shielded RJ-45
Size — 0.8"H x 1.7"W x 2.7"D (2 x 4.3 x 6.9 cm)

FAXBACK INFORMATION
Request Document Number: 15987
Call 412-746-5500 Anytime

Item	Code	Price
G.703 75–120 Adapter		
Male	MT242A-M	**$75.00**
Female	MT242A-F	**$75.00**

T1/E1 Repeaters

Good Things Come in Small Packages—Like High Speeds and Longer Ranges!

- **Extend the operating range of your T1/E1 equipment up to 1.4 mi. (2.2 km) over 22 AWG.**
- **Local loopback support.**
- **T1 speeds up to 1.544 Mbps, E1 speeds up to 2.048 Mbps.**

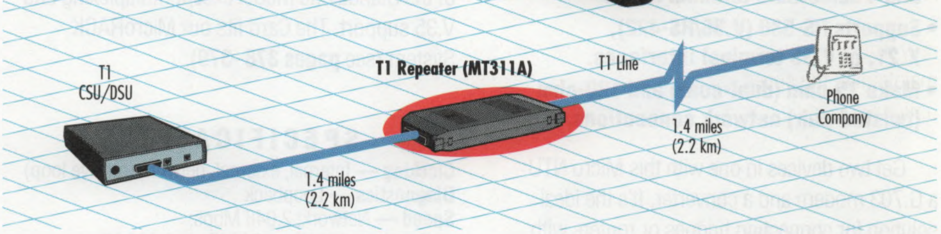
Do you have T1 and E1 equipment? Black Box has the extensions for your connections!

The T1 Repeaters are mini G.703 repeaters for extending the range of T1 (1.544 Mbps) equipment. The E1 Repeaters are mini repeaters for extending the range of E1 (2.048 Mbps) equipment.

The Repeaters support up to 39 dB attenuation at 772 KHz for T1 and up to 45 dB at 1024 KHz for E1. For 22 AWG cable, this represents a distance between Repeaters of up to 1.4 miles (2.2 km)!

And as for diagnostics? Both the T1 and E1 Repeaters provide local loopback support.

Choose from Indoor and Outdoor models. Outdoor versions are housed in an all-weather plastic case.



SPECIFICATIONS

Maximum Distance — Up to 1.4 mi. (2.2 km)

Dynamic Range — MT311A, MT313A: 0–39 dB, at 772 Kbps;
MT312A, MT314A: 0–45 dB, at 1.024 Mbps

Power — MT311A–MT312A: Via telco simplex line power, battery, or wallmounted AC power supply;
MT313A–MT314A: Via telco simplex line power

Item		Code	Price
T1 Repeater	Indoor	MT311A	**$500.00**
	Outdoor	MT313A	**$600.00**
E1 Repeater	Indoor	MT312A	**$675.00**
	Outdoor	MT314A	**$810.00**

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T1 CSU-B

Your Reliable Low-Cost Link to T1.

BLACK BOX®
T1 CSU-B
POWER
NETWORK LOS
EQUIPMENT LOS
LOOPBACK
ON
MANUAL LB
OFF
TEST JACKS
NET MON
EQ MON
EQ IN
EQ OUT
NET IN
NET OUT
POWER
NET
CPE

- **Complete the interface between T1 and your premise equipment.**
- **Works with channel banks, T1 muxes, PBXs, and more!**
- **Diagnostics ensure the data goes through.**
- **Transparent to ESF or SF framing formats and AMI or B8ZS line coding.**
- **Enables passive monitoring of data in either direction.**
- **Optional Power Supply available.**

Now you can establish an interface between a T1 carrier network and your premise equipment, such as channel banks, T1 muxes, PBXs, or other equipment with integral DSUs.

The T1 CSU-B also provides alarms, loopbacks, signal regeneration, line build-out, and surge protection. You get easy, menu-driven configuration with the 32-character LCD and LEDs. The unit stores network performance data for up to 24 hours and displays line status at a glance on the LCD.

This unit is also transparent to ESF or SF framing formats, and AMI or B8ZS line coding.

Two RJ-48C jacks provide interruptive Transmit and Receive connections between your DTE and the T1 carrier. A third jack gives you access for passive monitoring of data in either direction.

The T1 CSU-B can be powered from your telephone line or from the optional 110V Power Supply. Ask your phone company if your line is powered.

SPECIFICATIONS

Network Interface — 4-wire (T, R, T1, R1)

Signal Format — Bipolar with B8ZS transparency

Speed — 1.544 Mbps ± 50 bps

Connectors — (3) 8-pin modular (RJ-48C)

Power — Span: 60 to 140 mA at 30 volts;
Local: 20 to 50 mA at 48 volts

Size — 1.4"H x 6.3"W x 3.8"D (3.4 x 15.9 x 9.5 cm)

Item	Code	Price
T1 CSU-B	MT131A	**$495.00**
110V Power Supply (optional)	PS429	**$24.00**

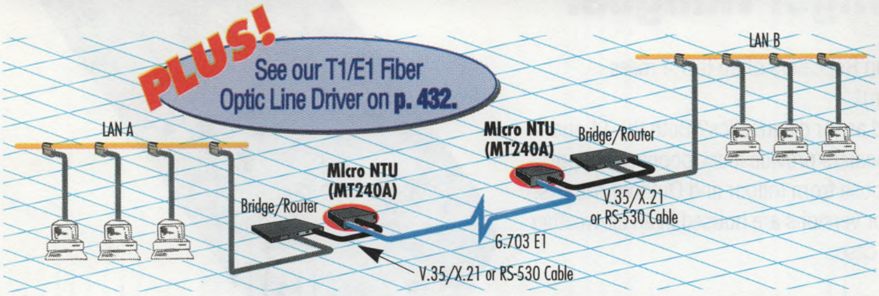
Need a modem for remote management?
We recommend...

Sportster® 33.6 Modem	000839-0	**$169.95**

For more details, see p. 398.

Micro NTU

An NTU and an Interface Converter in One. It's All You Need for G.703 Connections.



PLUS! See our T1/E1 Fiber Optic Line Driver on **p. 432.**

MT240A (front and rear views)

- **Network data rates to 2.048 Mbps, and 4 selectable terminal rates.**
- **Supports RS-530 (V.36/RS-422), X.21, or V.35 terminal interfaces.**
- **Make 75-ohm (dual-coax) and 120-ohm (twisted-pair) network connections.**

Get two devices in one with this Micro NTU: a G.703 modem and a converter. It's the ideal solution for connecting bridges or routers with RS-530, X.21, or V.35 (standalone only) interfaces to G.703 networks.

Use the Micro NTU as a modem to connect your equipment to your G.703 network. As a modem, the Micro NTU sends unstructured, synchronous 2.048-Mbps data from a G.703/E1 network to a router, bridge, or multiplexor.

You can also use the Micro NTU as an interface converter. It accepts either 75-ohm (dual-coax) or 120-ohm (twisted-pair) G.703/E1 signals and converts them so your RS-530, X.21, or V.35 equipment can read them.

You can also use the Micro NTU as a multiplexor. Use it to connect a device with a lower bandwidth (256 Kbps, 512 Kbps, or 1.024 Mbps) to a 2.048-Mbps G.703/E1 link.

The Micro NTU Card offers the same features of the Standalone model except multiplexing and V.35 support. The Card fits our MicroRACK System (see **pages 378–379**).

SPECIFICATIONS

Clocking — Internal, external, network (receive loop)
Diagnostics — Loopback
Speed — Network: 2.048 Mbps; Terminal: 256 Kbps, 512 Kbps, 1.024 Mbps, 2.048 Mbps
CE Approval — MT240A, MT240A-48V, MT242A, MT245A–MT246A
Interface — Network: G.703; Terminal: RS-530 (V.36/RS-422), C.21 on HD26, V.35 (standalone models only)
Indicators — (5) LEDs: power, network, master clock, loop, and loopback
Power — 115 VAC/60 Hz or 230 VAC/50 Hz, switch-selectable
Size — 7.3"H x 6.6"W x 1.6"D (18.5 x 16.8 x 4.1 cm)

FAXBACK INFORMATION
For Micro NTU G.703: 15970,
For G.703 75–120 Adapter: 15987
Call 412-746-5500 Anytime

MicroRACK Compatible

MT245A

Item	Code	Price
Micro NTU G.703		
Standalone AC	MT240A	**$1295.00**
48-VDC	MT240A-48V	**$1495.00**
Card (Fits MicroRACK System on **pages 378–379**)		
120-Ohm	MT245A	**$1195.00**
75-Ohm	MT246A	**$1195.00**
For simple G.703 75–120-ohm conversion...		
G.703 75–120 Adapter (Specify Male or Female)	MT242A	**$75.00**

For more details, see page 432.

remember to order cables

	Code	Price
HD26M/DB25M Adapter Cable		
M/M	EHN092-530M	**$49.95**
F/F	EHN092-530F	**$49.95**
HD26M/M34M Adapter Cable		
M/M	EHN092-V35M	**$89.95**
F/F	EHN092-V35F	**$89.95**
HD26M/DB15M Adapter Cable		
M/M	EHN092-X21M	**$49.95**
F/F	EHN092-X21F	**$49.95**

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E1 CSU/DSU • E1 Mux

Go International with E1.

MT105A (top) and MT201A (bottom)

Item		Code	Price
E1 CSU/DSU	V.35	MT105A-35	**$1495.00**
	RS-530	MT105A-530	**$1495.00**
	RS-449	MT105A-449	**$1545.00**
E1 Mux 2-Port	V.35	MT201A-35	**$2795.00**
	RS-449	MT201A-449	**$2795.00**
4-Port	V.35	MT203A-35	**$2995.00**
	RS-449	MT203A-449	**$2995.00**

remember to order cables *Different applications require different cables. Call Tech Support to be sure you order the right one.*

E1 CSU/DSU

- **Your easy connection to international E1 lines.**
- **Interfaces to fit V.35, RS-449, or RS-530 DTEs.**

Get cost-effective international access to E1 and Fractional E1. Our E1 CSU/DSU converts your high-speed V.35, RS-449, or RS-530 interface to a 2.048-Mbps G.703 signal. It complies with ITU-T G.703, G.704, and G.732 standards, making it compatible with nearly all international telephone companies and E1 or Fractional E1 carrier services.

FAXBACK INFORMATION
Request Document Number: 15994
Call 412-746-5500 Anytime

E1 Mux

- **Interfaces to fit V.35 or RS-449 DTEs.**
- **Converts T1 (DSX) to E1.**
- **Front-panel LCD and pushbutton controls for complete menu management.**

Consolidate and manage all your communications over a single E1 line. The E1 Mux will connect two to four channels of LAN bridges, routers, PBXs, printers, or computers. Or you can consolidate multiple T1 channels onto an E1 line—perfect if you have offices both in countries that use T1 and in countries that use E1.

The E1 Mux is completely compatible with all E1 and Fractional E1 interfaces. A built-in CSU/DSU enables a direct connection to E1. Manage the Mux via the front-panel menu controls or, if you prefer, connect an ASCII terminal or PC for configuration.

Black Box Explains...

SNMP for WAN Management.

Simple Network Management Protocol (SNMP) is the preferred tool for managing local area networks.

Working from a centrally located computer, system administrators can reconfigure distant segments of their network empire, or poll attached bridges, routers, and other SNMP devices for up-to-date performance information, all in just minutes—and without leaving their offices.

That same simplicity is also what makes SNMP the perfect tool for managing wide-area networks as well.

Taking SNMP to the WAN.

SNMP is commonly used to manage LAN bridges and routers, but more and more equipment manufacturers are including SNMP support in their CSU/DSUs, which provide the high-speed link to DDS and T1 lines. By extending SNMP support to these components, WAN administrators can effectively reach past their bridges and routers—to the very ends of a LAN and beyond—to control and manage every major device in their WAN.

Get Set—for Simplicity.

With SNMP CSU/DSUs serving as the linchpins of your WAN, it's possible to both pinpoint and troubleshoot system problems or perform remote configuration from any SNMP management workstation anywhere your network goes, using just two simple commands: **Get** and **Set**.

Mastering these two commands is easy and the key to SNMP's simplicity. By issuing properly formatted Get and Set requests, you can access devices with onboard SNMP agents or standalone devices running proxy agents, and retrieve or write information to their Management Information Bases (MIBs)—easily and economically.

You can even set conditional alarms to automatically alert operations staff in case of trouble so you can take appropriate action to resolve problems fast.

So Take Total Control of Your WAN—with SNMP!

No matter where you are or where your WAN goes, you're in absolute control with BLACK BOX® CSU/DSUs and SNMP. Call our Technical Experts today for more information.

BUYER'S GUIDE

T1 CSU/DSUs & MUXES

				Port Interface					Active Ports	Active T1 Lines	Line Type			Max. Speed (Mbps)	Style		Mgmt.
Item	Page	Code	Price	V.35	RS-449	RS-530	RS-232	DSX-1	Total Number	Total Number	T1	Fractional T1	DDS	Sync	Standalone	Rackmount	SNMP
T1 CSU/DSU	436	MT100A-35-R2	$1295.00	1					1	1	✓	✓		1.536	✓		
	436	MT100A-530-R2	$1295.00			1			1	1	✓	✓		1.536	✓		
	436	MT100A-449-R2	$1345.00		1				1	1	✓	✓		1.536	✓		
DDS/T1 Super DSU	436	MT102A	$1495.00	1		1	1		1	1	✓	✓	✓	1.536	✓		SLIP
T1/CSU/DSU SNMP SP	437	MT172A	$1395.00	1					1	1	✓	✓		1.536	✓		SLIP
with SNMP	437	MT170A	$2695.00	2		2			2	1	✓	✓		1.536	✓		10BASE-T
T1 IMUX-2	438	MT280A	$7000.00	1					1	2	✓	✓		2.944	✓		
T1 IMUX-4	438	MT285A	$9000.00	1					1	4	✓	✓		5.888	✓		
T1 CSU/DSU Card	438	MT510A	$1295.00	1	1	1				1	✓	✓		1.536		✓	
Fractional T1 Multiplexor	439	MT202A-P35-R2	$2995.00	1				1	2	1	✓	✓		1.536	✓		
	439	MT202A-35-R2	$2495.00	2					2	1	✓	✓		1.536	✓		
	439	MT202A-449-R2	$2495.00		2				2	1	✓	✓		1.536	✓		
	439	MT200A-449/449-R2	$3450.00		4				4	1	✓	✓		1.536	✓		
	439	MT200A-35/232-R2	$3450.00	2			2		4	1	✓	✓		1.536	✓		
	439	MT200A-449/232-R2	$3450.00		2		2		4	1	✓	✓		1.536	✓		
	439	MT200A-P35/449-R2	$3950.00	1	2			1	4	1	✓	✓		1.536	✓		
	439	MT200A-P35/232-R2	$3950.00	1			2	1	4	1	✓	✓		1.536	✓		
	439	MT200A-P35/P35-R2	$4450.00	2				2	4	1	✓	✓		1.536	✓		
	439	MT200A-P35/35-R2	$3950.00	3				1	4	1	✓	✓		1.536	✓		
	439	MT200A-35/449-R2	$3450.00	2	2				4	1	✓	✓		1.536	✓		
	439	MT200A-35/35-R2	$3450.00	4					4	1	✓	✓		1.536	✓		
T1 Channel Bank	440-441	MT400A & Accessories	$4880.00	✓		✓	✓	✓	48	2	✓	✓		1.536		✓	

X.25/Frame Relay
Multiplexors
Data/Voice Muxes
Local Muxes
Data-Line Sharers

T1 CSU/DSUs

You're Paying Top Dollar for T1—Make Sure Your T1 CSU/DSU Is a Premier Performer.

TECH SUPPORT'S PRODUCT OF CHOICE
BLACK BOX
T1 CSU/DSU

- **100% compliance with AT&T® specs for full and fractional T1.**
- **Supports Frame-Relay services from major telecomm providers.**
- **Use in pairs on-site to support T1-speed line-driver links up to 6000 feet (1828 m).**

It's perfect for image transfer, LAN-to-WAN enterprise links, videoconferencing, or host-to-host communications. This is the premise interface you need to access high-speed T1 service.

Another option is to use a pair of these CSU/DSUs in-house as line drivers to extend a point-to-point T1 link. You get high speeds via shielded twisted pair and support for tail circuits. Local/remote loopback tests make troubleshooting easy. Three interface models are available: V.35, RS-530, and RS-449.

SPECIFICATIONS

Clocking — From the network, the DTE, or internal clock
Diagnostics — Local composite loopbacks; remote CSU loopbacks; local and remote channel loopbacks
Framing Format — D4 or ESF
Speed — Composite channel: 1.544 Mbps; DTE channel: 56 Kbps to 1.536 Mbps
Standards — AT&T Publications 62411 and 54019A
Interface — Composite: T1 carrier; Channel: V.35, RS-530, or RS-449
Connectors — Composite: RJ-48 female; Channel: 34-pin M-block female or DB25 female
Power — 115-VAC external power supply (included)

FAXBACK INFORMATION
Request Document Number: 11000
Call 412-746-5500 Anytime

Item	Code	Price
T1 CSU/DSUs		
V.35	MT100A-35-R2	**$1295.00**
RS-530	MT100A-530-R2	**$1295.00**
RS-449	MT100A-449-R2	**$1345.00**
You may also need...		
T1 Non-Span Surge Protector	SP513A-R2	**$79.00**
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**
For other lengths or genders, see p. 89.		
RJ-45 T1 CSU/DSU (STR) Cable	EHM031-0010	**$20.50**

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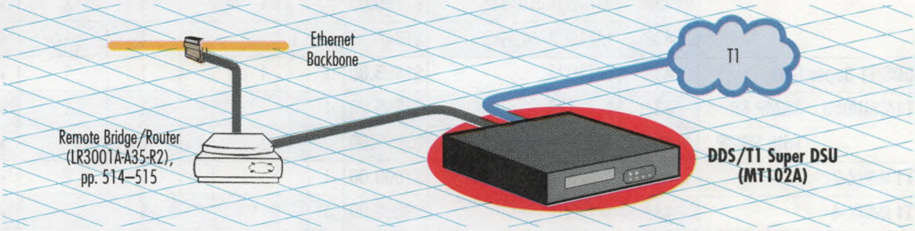
DDS/T1 Super DSU

Monitor Network Activity from Your Workstation with SNMP Management.

BLACK BOX
DDS/T1 Super DSU

MT102A, Front View


Ethernet Backbone
T1
Remote Bridge/Router (LR3001A-A35-R2), pp. 514–515
DDS/T1 Super DSU (MT102A)

- **Complete SNMP management via SLIP connection.**
- **Enables smooth internetwork operations.**
- **Easy LCD configuration.**
- **Both a complete 56/64-Kbps DDS CSU/DSU *and* a T1 ESF CSU/DSU.**
- **Your *perfect* choice for Frame Relay.**

In today's complex network environments, it's important that all your major network devices be accessible for troubleshooting and quick diagnostics. That's why you need the completely SNMP-manageable DDS/T1 Super DSU.

SNMP management makes the Super DSU ideal for managing your bridges and routers—right from your workstation. And when it's used as a front end for a router, you can establish a smoothly operating internetwork.

You can also diagnose and configure the CSU/DSU with pushbuttons and an easy-to-read LCD panel or from any ASCII terminal.

FAXBACK INFORMATION
Request Document Number: 16744
Call 412-746-5500 Anytime

The Super DSU also supports DDS—so it's the perfect choice for running your DDS or T1 line into Frame Relay! No matter how large your internetwork grows, the DDS/T1 Super DSU can handle your CSU/DSU needs.

For more information on the technologies with DDS/T1 Super DSU, see "Black Box Explains SNMP for WAN Management" on **page 435** and "Black Box Explains The Frame-Relay Advantage" on **page 501**.

SERIAL PORT
NETWORK INTERFACES
T-1
56Kbps-DDS
SNMP
CONSOLE

MT102A, Rear View

SPECIFICATIONS

Clocking — Internal, frequency locked to network (loop time), frequency locked to serial port (ext)
Diagnostics — Remote and local loopback, test patterns
Management — SNMP MIB II over UDP/IP/SLIP interface
Speed — Up to 64 Kbps or up to 1.544 Mbps
Connectors — 8-Position RJ-48C, DB25 female (M/34 adapter included)
Indicators — Alarm, Loop BPV, Density, 32-character LCD screen; Network: Loop, Density, BPV, Alarm; Serial: Test, Loop, DCD
Power — 90–230 VAC, 47–63 Hz, autosensing
Size — 1.8"H x 8.4"W x 10"D (4.6 x 21.3 x 25.4 cm)
Weight — 7 lb. (3.2 kg)

Item	Code	Price
DDS/T1 Super DSU	MT102A	**$1495.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83. ***Specify gender when ordering.***		
V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**
For other lengths or genders, see p. 89.		

T1 CSU/DSU-SNMP SP

Get the Control and Speed You've Always Wanted for Linking Networks.

- **V.35 channel.**
- **SNMP and Telnet management via SLIP port.**

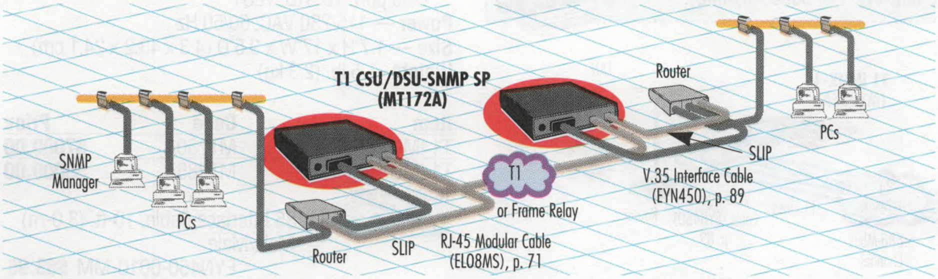
If you're building an internetwork over T1 or Frame Relay, the T1 CSU/DSU-SNMP SP has the management options and performance you need. This CSU/DSU supports T1 or FT1, for greater application flexibility, plus a high-speed interface for linking routers and other digital devices to your WAN.

An SNMP-manageable SLIP interface provides simple connections to your existing LAN.

SPECIFICATIONS

Diagnostics — V.54 loopback, QRSS test, 511 test, Net/Agg loopback, TX/RX monitor jack, Net/Data loopback, remote net loopback, remote dial on alarm
Protocol — Sync or async; SNMP, Telnet
Interface — V.35, SLIP
Connectors — (1) V.35 female, (1) RJ-48, (2) RJ-45
Power — 115–230 VAC, 60–50 Hz
Size — 1.5"H x 7.5"W x 10.5"D (3.8 x 19.1 x 26.7 cm)
Weight — 3 lb. (1.4 kg)

FAXBACK INFORMATION
Request Document Number: 14027
Call 412-746-5500 Anytime


T1 CSU/DSU-SNMP SP
(MT172A)
SNMP Manager
PCs
Router
SLIP
RJ-45 Modular Cable (EL08MS), p. 71
T1
or Frame Relay
Router
SLIP
V.35 Interface Cable (EYN450), p. 89
PCs

Item	Code	Price
T1 CSU/DSU-SNMP SP	MT172A	$1395.00
To protect your T1 CSU/DSU, order our...		
T1 Non-Span Surge Protector	SP513A-R2	$79.00
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	$83.95

For other lengths or genders, see p. 89.

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T1 CSU/DSU with SNMP

Now You Can Manage Your Entire WAN— Even the CSU/DSU!

- **Dual-port.**
- **SNMP via 10BASE-T port.**
- **Full-featured two-channel T1 CSU/DSU.**

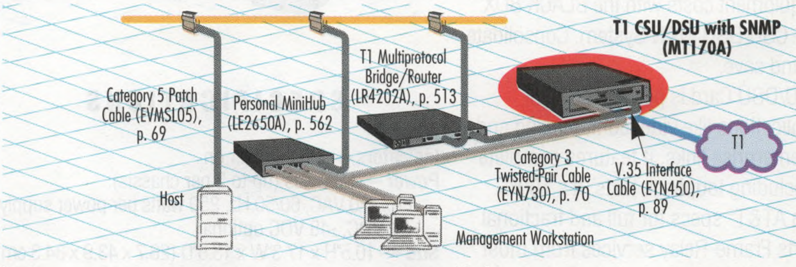
The T1 CSU/DSU with SNMP is a full-featured CSU/DSU that includes SNMP on board, so you can manage every aspect of your network.

It features built-in SNMP MIB II and Telnet™ management, and it connects to a network using 10BASE-T. No proxy agent required. You can run full D4 and ESF diagnostics from your SNMP or Telnet workstation. Configure your system remotely from a VT100™ terminal or a PC over a modem connection—the convenient menu-driven interface makes it simple. You get control of hardware reset, loss of signal, out-of-frame, all-"ones" signaling, yellow alarms, and more.

FAXBACK INFORMATION
Request Document Number: 13693
Call 412-746-5500 Anytime

SPECIFICATIONS

Diagnostics — Network, local T1 (analog), remote CSU loopbacks, support for AT&T® Publication 54016 and ANSI T1.403
Speed — Up to 1.536 Mbps
Interface — V.35, RS-530
Connectors — Channel: (2) DB25 female (34-pin M-block adapter included for V.35); RS-232 Management: (1) DB25 female; SNMP port: (1) RJ-45 female; Network: (1) RJ-48 female
Power — +5 VDC ±12, 6 watts
Size — 3"H x 9.7"W x 10.8"D (7.6 x 24.6 x 27.4 cm)
Weight — 4 lb. (1.8 kg)


Category 5 Patch Cable (EVMSL05), p. 69
Personal MiniHub (LE2650A), p. 562
T1 Multiprotocol Bridge/Router (LR4202A), p. 513
T1 CSU/DSU with SNMP
(MT170A)
T1
Host
Category 3 Twisted-Pair Cable (EYN730), p. 70
V.35 Interface Cable (EYN450), p. 89
Management Workstation

Item	Code	Price
T1 CSU/DSU with SNMP	MT170A	$2695.00
To protect your T1 CSU/DSU, order our...		
T1 Non-Span Surge Protector	SP513A-R2	$79.00
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	$83.95
	For other lengths or genders, see p. 89.	
Category 3 Twisted-Pair Cable, PVC Straight-Pinned	EYN730MS-MM	$6.95 + $.11/ft.

For other lengths and pinnings, see p. 70.

T1 IMUX

Bring on the Bandwidth! Forget T3— Run Your Routers at Speeds up to 5.8 Mbps on T1!

- **Combines two or four T1 lines into one DTE connection.**
- **Speeds from 1.4 to 5.8 Mbps.**
- **Complies with AT&T® standards.**

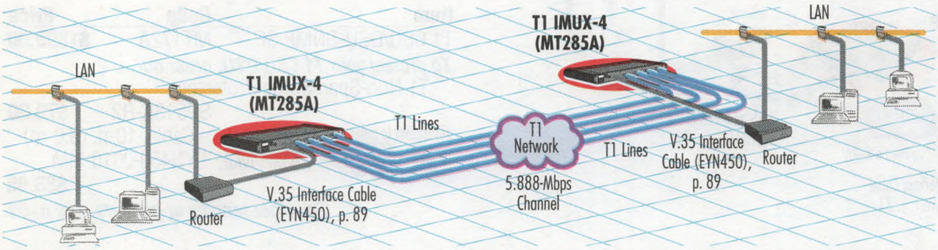
Get the speeds your application demands—without the expense of T3. Our Inverse Multiplexor combines two or four T1 lines into one DTE line. You can connect your router to this "composite" T1 line and run at 5.8 Mbps. Your costs stay low, especially since T1 rates continue to fall.

Load-sharing improves the fault-tolerance of your high-speed connection. If one of the T1 links fails, the communication link will stay up. Rate fallback is automatic.

To reconstruct the data stream, the Multiplexor automatically compensates for any differential delays among the T1 lines.

Connection to DTE is immediate upon installation. Diagnostics include local and remote DTE and T1 loopback plus BERT V.52.

FAXBACK INFORMATION
Request Document Number: 14034
Call 412-746-5500 Anytime



SPECIFICATIONS

Data Channels — 2 or 4
Speed — T1: 1.544 Mbps;
Data: Any multiple of 1.472 Mbps, up to 5.888 Mbps
CE Approval — All items listed are approved
Interface — T1: ITU Rec. G.703, G.704, AT&T® TR-62411, PUB 54016; Data: V.35
Connectors — (1) 34-point female for V.35, (4) RJ-48 female
Indicators — Local and remote sync loss; Data port: TD, RD, TEST
Power — 115/230 VAC, 60/50 Hz
Size — 1.7"H x 17"W x 9.5"D (4.3 x 43.2 x 24.1 cm)
Weight — 5 lb. (2.3 kg)

Item	Code	Price
T1 IMUX-2	MT280A	**$7000.00**
T1 IMUX-4	MT285A	**$9000.00**

remember to order **cables**

V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

For other lengths or genders, see p. 89.

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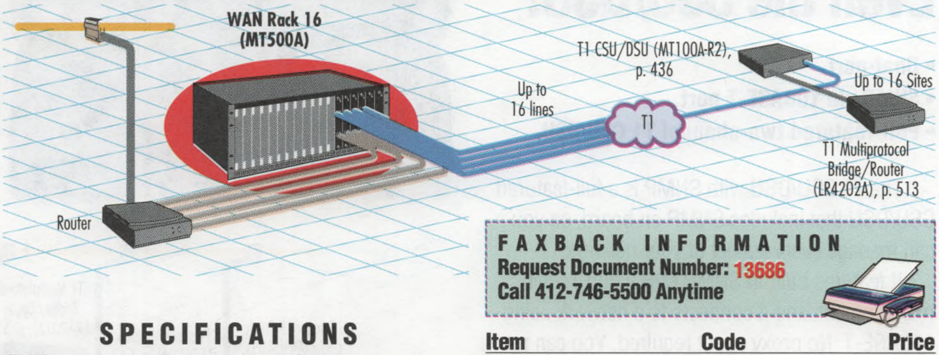
MT500A with MT510A installed.

Rackmount T1 CSU/DSU WAN System

Save Space and Money—Centralize up to 16 T1 Lines.

- **Holds up to 16 T1 multiplexor cards and T1 CSU/DSU Cards.**
- **Each Card supports full or fractional T1 lines.**
- **Supports V.35, RS-530, and RS-449 interfaces.**



Cut your equipment costs with the BLACK BOX® Rackmount T1 CSU/DSU WAN System. Consolidate your T1 lines and save.

The T1 CSU/DSU Card is perfect for high-bandwidth applications like videoconferencing and LAN-to-WAN enterprise links. It features complete diagnostics, including loopback tests. It's 100% compliant with AT&T® specs for full and fractional T1 and supports Frame-Relay services from most major telecomm providers.

The Rack includes a Power Module (115 VAC, -24 VDC, or -48 VDC). Configuration and management are menu-driven via an RS-232 port.

Future enhancements will include module-to-module channel passing and T3/ATM compatibility. Call Tech Support for details.

SPECIFICATIONS

Rack:
Indicators — LED; Power on
Power — Modules (up to 2 per chassis): 115/220 VAC, 60/50 Hz, 250 watts per power supply; -24 VDC, -48 VDC optional
Size — 10.5"H x 17.3"W x 13.5"D (26.7 x 43.9 x 34.3 cm)
Weight — Empty: 21 lb. (9.5 kg); Full: 51.5 lb. (23.4 kg)

Card:
Speed — Each port up to full T1 (1.536 Mbps) in 56-Kbps or 64-Kbps increments
Interface — V.35, RS-530, or RS-449
Connectors — (2) DB25 female

FAXBACK INFORMATION
Request Document Number: 13686
Call 412-746-5500 Anytime

Item	Code	Price
WAN Rack 16		
AC	MT500A	**$2195.00**
-24 VDC	MT500A-24V	**$2195.00**
-48 VDC	MT500A-48V	**$2195.00**
WAN Rack Power Module		
AC	MT505A-AC	**$475.00**
-24 VDC	MT505A-24VDC	**$475.00**
-48 VDC	MT505A-48VDC	**$475.00**
T1 CSU/DSU Card	MT510A-R2	**$1295.00**

remember to order **cables**

WAN Rack Cable		
V.35	EHN090-35	**$75.00**
RS-449	EHN090-449	**$75.00**
RS-530 Data Cable, 10-ft. (3.0-m) Male/Male	EVN530-0010-MM	**$41.95**

For other lengths or genders, see p. 88.

Fractional T1 Multiplexors

Merge Voice, Video, and Data Traffic onto One High-Speed T1 Link—for BIG Savings!

- **Multiple interfaces to fit a variety of DTEs: RS-232, RS-449, V.35, or DSX-1.**
- **Two or four ports—fits any size network.**
- **Front-panel LCD and pushbutton controls for complete menu management.**
- **Allocate DS0 subchannels any way you want.**

BLACK BOX®
FT1-4

One FT1 Multiplexor is all you need to consolidate and manage all your business communication over one T1 line. These cost-effective Muxes maximize links between distant locations. You can connect two to four channels of LAN bridges, routers, PBXs, printers, or computers.

A T1 line can carry subrate digital services like DDS (**see diagram**) plus voice services such as M24, WATS, and 800 lines.

Each FT1 Mux has a built-in CSU/DSU for a direct connection to T1. That saves you the cost of buying separate CSUs to attach the T1 line.

But best of all, you get all the power and performance of comparable T1 muxes for a fraction of the cost. And both models are fully compliant with AT&T and ANSI T1 standards.

All the speeds and interfaces you need.

Order your FT1 Mux with a range of interface options to connect the right combination of voice and data equipment. The chart **below** shows you all the options. Also, each DTE interface supports the full range of speeds from 2.4 Kbps to 1.544 Mbps.

Complete T1 compatibility.

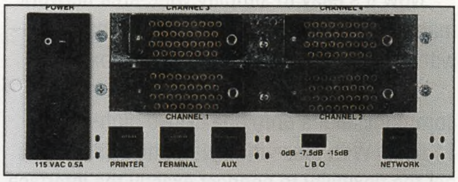
FT1 Muxes are a perfect fit with any T1 service, no matter where you're located. Run full or fractional T1 from AT&T®, MCI®, and Sprint®. The Muxes are compatible with Frame-Relay services, too, from major carriers like WillTel®, MCI, and Sprint.

FAXBACK INFORMATION
Request Document Number: 11488
Call 412-746-5500 Anytime

Manage each Mux via the front-panel menu controls—or, if you prefer, connect an ASCII terminal or PC for configuration. Store four backup configurations in memory. Switch to them quickly as you replace equipment or your system grows.

With the diagnostic menu functions, you can even troubleshoot service problems on the T1 line. Pinpoint trouble spots yourself to save time dealing with the phone company. Even print out alarms via the separate printer port.

More—you can use two FT1 Muxes to build a high-speed, on-site line-driver link. With speeds to 1.536 Mbps, you can rocket data up to a mile via 22 AWG wire, just as efficiently as sending data across the country.



MT200A Rear View

*Here's just a sample of the connector options available for these T1 Multiplexors. The chart (**below, left**) shows the complete line. Choose just the right options for your application!*

SPECIFICATIONS

Clocking — Three sources: internal, network-supplied, or DTE-supplied

Diagnostics — Local composite loopbacks, remote CSU loopbacks, local and remote channel loopbacks

Framing Format — D4 or ESF

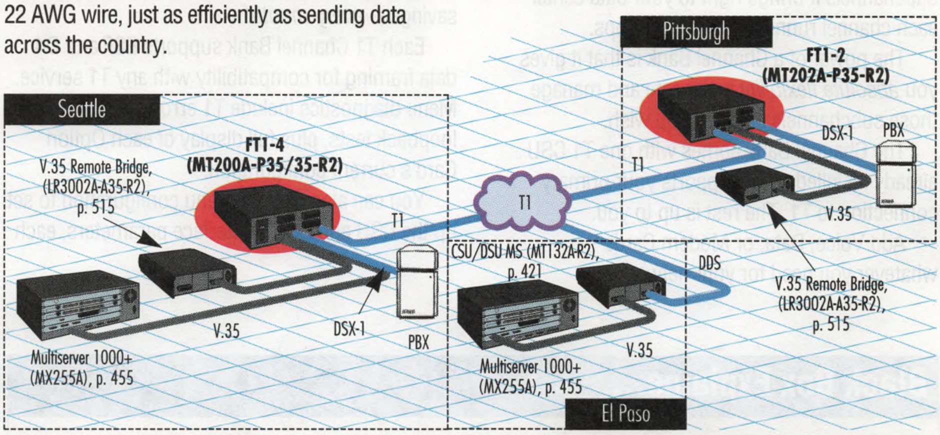
Speed — Composite Channel: 1.544 Mbps;
DTE Channel: 56 Kbps to 1.536 Mbps;
DS0s: Independently assigned per channel (1–24)

Standards — AT&T Publications 62411 and 54019A; ANSI T1.403

Interface — Composite Channel: T1 carrier interface;
DTE Channel: V.35, RS-232, or RS-449;
PBX: DSX-1

Connectors — Composite Channel: (1) RJ-48C female;
DTE Channel: V.35: (4) 34-pin M-block female;
RS-232: DB25 female; RS-449: DB37 female

Power — 85–264 VAC, 47–440 Hz (40 watts), autosensing, internal supply


Seattle
V.35 Remote Bridge, (LR3002A-A35-R2), p. 515
FT1-4 (MT200A-P35/35-R2)
T1
Multiserver 1000+ (MX255A), p. 455
V.35
DSX-1
PBX
T1
Pittsburgh
FT1-2 (MT202A-P35-R2)
T1
DSX-1
PBX
V.35
V.35 Remote Bridge, (LR3002A-A35-R2), p. 515
CSU/DSU MS (MT132A-R2), p. 421
DDS
Multiserver 1000+ (MX255A), p. 455
V.35
El Paso

FRACTIONAL T1 MULTIPLEXOR SELECTION CHART

Item	Number of Channels				Code	Price
	RS-232	RS-449	V.35	DSX-1		
FT1		4			MT200A-449/449-R2	**$3450.00**
	2		2		MT200A-35/232-R2	**$3450.00**
	2	2			MT200A-449/232-R2	**$3450.00**
		2	1	1	MT200A-P35/449-R2	**$3950.00**
	2		1	1	MT200A-P35/232-R2	**$3950.00**
			2	2	MT200A-P35/P35-R2	**$4450.00**
			3	1	MT200A-P35/35-R2	**$3950.00**
		2	2		MT200A-35/449-R2	**$3450.00**
			4		MT200A-35/35-R2	**$3450.00**
FT1-2			1	1	MT202A-P35-R2	**$2995.00**
			2		MT202A-35-R2	**$2495.00**
		2			MT202A-449-R2	**$2495.00**

Item	Code	Price
remember to order cables T1 Cable 10-ft., (3.0-m)	EHM031-0010	**$20.50**
Order interface cables to connect the FT1-4 and FT1-2 Muxes to your local DTEs...		
V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**
For other lengths or genders, see p. 89.		
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83. Specify gender when ordering.		
DB37 Interface Cable, 10-ft (3.0-m) Male/Male	EDN37J-0010-MM	**$43.95**
For other lengths or genders, see p. 110.		

Simplify Your WAN Management and Expansion with the BLACK BOX®

T1 Channel Bank

Now it's easy to simplify wide-area network management—and plan for future expansion—with a T1 Channel Bank from Black Box.

Use it to consolidate all your corporate communications onto one or two high-speed T1 lines. With these multiple-option Cards, you get the flexibility to connect exactly the interface options you need (**facing page**). And with 12 expansion slots, you get plenty of room for your existing global network or for future WAN growth and expansion.

Comprehensive Menu Configuration—One PC or terminal controls your entire network. Even run diagnostics—*all from a single site!*

Versatility—Merge and manage voice channels, data channels, digital service lines, and voice services like 800-calling, WATS lines, and tie lines—*all from a single unit!*

Modular Components—The heart of the system, modular components bring your Channel Bank to life. Change configurations as your network changes. Add on as your business grows—even around the globe. The T1 Channel Bank delivers it all *in a very affordable package!*

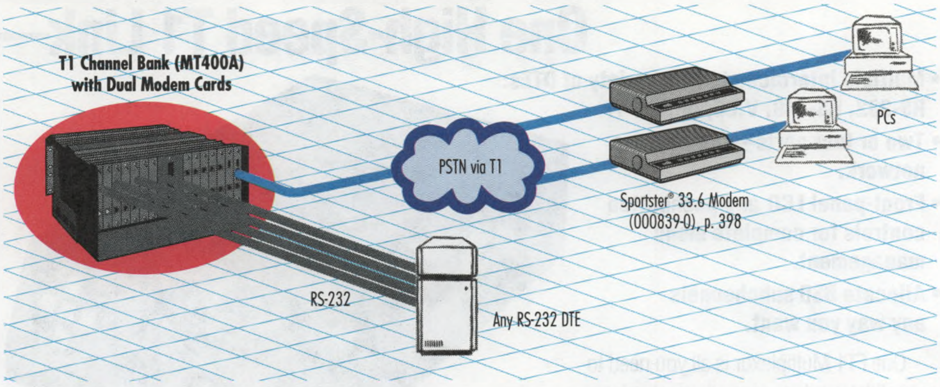
How Does It Work?

The power of a T1 line is the 24 DSO subchannels it brings right to your data center—each channel running at 56 or 64 Kbps.

The power of a Channel Bank is that it gives you *absolute flexibility* to allocate and manage those subchannels any way you wish.

The Channel Bank comes with one T1 CSU already installed. That supports your primary connection to T1. The rest is up to you.

Add Voice, Data, or Modem Cards—whatever you need for your network.


T1 Channel Bank (MT400A) with Dual Modem Cards
PSTN via T1
PCs
Sportster® 33.6 Modem (000839-0), p. 398
RS-232
Any RS-232 DTE

Build a T1 WAN—Support voice and data communication to multiple remote sites.

Modem Solutions—Run a point-to-point data-only operation without modems or CSU/DSUs at the host site (see the diagram **above**).

Programmable Configurations—Set the Channel Bank to support different links at different times for great savings: all-voice during the day, all-data at night, when rates are low!

Eliminate Multiple Data Lines and Save—A single T1 line costs roughly the same as four 56-Kbps DDS lines. By running just one T1 line, you save on extra hardware and all those extra leased lines. The Channel Bank pays for itself quickly. Then it starts paying you back in earned savings—*every month!*

Each T1 Channel Bank supports ESF and D4 data framing for compatibility with any T1 service. Menu diagnostics include T1 error monitoring and loopback tests, plus full display of each Option Card's current configuration.

You can also use the menu configuration to set up the CSU and DSX-1 interface parameters, each individual DSO subchannel, and automatic fallback if you add redundant T1 channels with the T1-CB Cards.

For redundant power, order the T1-CB Utility Shelf with AC (MT457).

MT400A, rear view

T1 CHANNEL BANK SPECIFICATIONS

Line Code — AMI, B7, B8ZS
Multiplexing Technique — Time-division
Network Configurations — End mux; dumb or smart channel bank; drop and insert mux
Operating Temperature — 32 to 122° F (0 to 50° C)
T1 Interface — Electrical, DSX-1; Mechanical, DB15
Power — 115 VAC, 60 Hz, 65 W max. or -48 VDC
Size — 8.8"H x 19"W x 20"D (22.4 x 48.3 x 50.8 cm)
Weight — 14 lb. (6.4 kg)

Black Box Explains...

T1 Channel Banks.

T1 is a digital transmission method for multiplexing multiple voice and data channels over two pairs of wires.

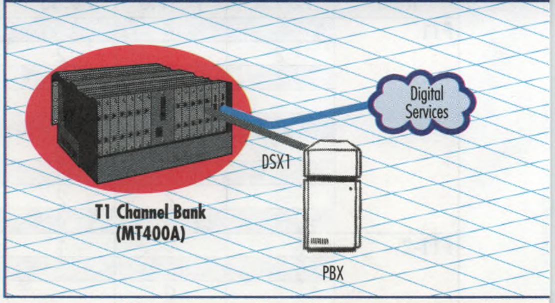
By using a technique called Time-Division Multiplexing (TDM), T1 interleaves both voice and/or LAN data across DSO subchannels. The primary benefit of T1 is bandwidth—1.544 Mbps—available in 24 easily allocated 64-Kbps DSO subchannels.

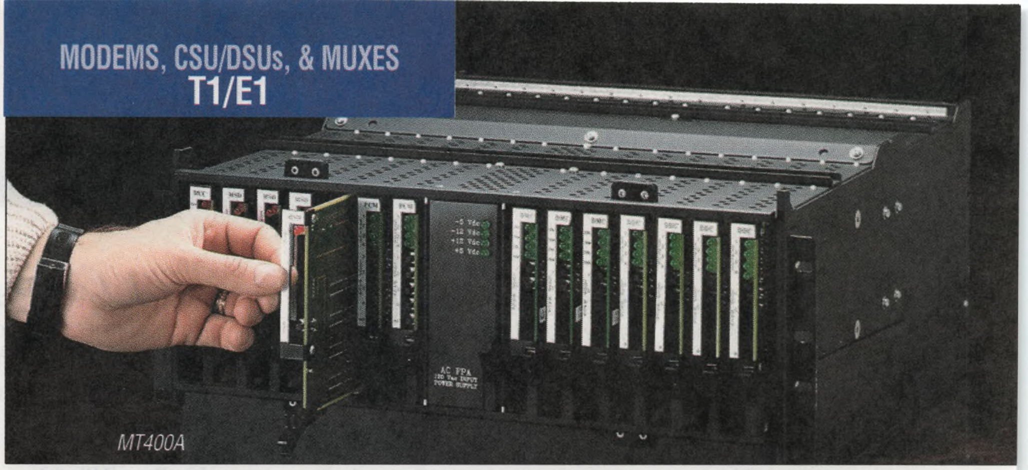
T1 sends data in frames made up of 24 eight-bit words (one word for each subchannel) and one framing bit for a total of 193 bits per frame. A T1 channel transmits 8000 frames per second.

The framing bits on successive frames follow a pattern for a superframe format. The T1 Channel Bank checks this pattern to make sure synchronization is maintained.

T1 is the most flexible end-to-end digital service option available today. It's the preferred service for internetworking voice, data, fax, and video signals across an enterprise network. And Black Box is your supplier of T1 hardware, with a broad range of solutions for consolidating your global high-speed network management.

Add a PBX to the Line—





T1 Channel Bank.

Here's What You Get:

- (1) T1 Channel Bank with built-in T1 CSU and onboard power supply.
- (12) Expansion slots for precision network customization and plenty of room to grow.
- (9) Optional Card modules. Integrate T1, voice, video, and data lines any way you want in one easy-to-manage chassis.
- *Plus*—you get the full support of Black Box's technical experts.

Here's What You Can Do:

- Eliminate multiple voice and data lines from your main site. Merge them all onto just one T1 line.
- Support up to two active T1 lines, and up to two backup T1 lines.
- Program automatic reconfigurations for unique time-of-day applications.
- Create a low-cost 24-modem nest for modem pooling.

T1 Channel Bank

Item	Code	Price
T1 Channel Bank with CSU (Shown Above)	MT400A	**$4880.00**
T1-CB Utility Shelf with AC	MT457	**$1750.00**

For the application illustrated, we recommend using:

Sportster® 33.6 Modem	000839-0	**$149.95**

For more details, see p. 398.

Find Out More!
Call Our Experts:
412-746-5500.

Just Drop and Insert!

"Drop and Insert" is the term for splitting DS0 channels among devices.

For example, you "drop" some DS0 subchannels from the T1 Channel Bank to connect to your PBX. Once they're connected, you "insert" them back into the T1 data stream.

With Drop and Insert, you specify the precise destination of each DS0 (voice or data) passing through the Channel Bank.

Data Cards

T1 CB High-Speed Data Cards

V.35 and RS-530 Cards operate in 56- or 64-Kbps increments up to 1.344 or 1.536 Mbps, for digital access at 1.536 Mbps. The RS-232 Card connects point-to-point data circuits at 56 or 64 Kbps.

Item	Code	Price
T1 CB HS Data Cards		
V.35	MT415C-35	**$700.00**
RS-530	MT415C-530	**$700.00**
RS-232	MT415C-232	**$700.00**

Dual Data Cards

Each Card provides two channels and uses two T1 DS0s. For V.35, order V.35 Adapter Cable; for RS-530 or RS-232, order DB25 Adapter Cable (specify male or female connectors).

Item	Code	Price
Dual Data Cards		
V.35	MT420C-35	**$1200.00**
RS-530	MT420C-530	**$1200.00**
RS-232	MT420C-232	**$1200.00**

remember to order cables

The Data Cards require special cables. Be sure to order the right one below:

V.35 Adapter Cable		
V.35 Male	EHN081-0015-MM	**$150.00**
V.35 Female	EHN081-0015-MF	**$150.00**

DB25 Adapter Cable		
RS-232 or RS-530 Male	EHN080-0015-MM	**$100.00**
DB25 Female	EHN080-0015-MF	**$100.00**

T1-CB OCU-DP 56/64

Links your CSU/DSU to the Channel Bank, for connection of remote bridges, routers, etc.

T1-CB OCU-DP 56/64		
56/64	MT419C	**$1450.00**

4-Wire Analog

Use this Card to connect an analog leased-line modem to the Channel Bank.

T1-CB 4-Wire Analog Card	MT418C	**$1000.00**

Analog Voice Cards

Voice Cards

The 4W E&M Card terminates a 4-wire E&M voice channel (Types I-III). The FXS Card allows direct phone connection with ring-back tone capability (requires the T1-CB Bat/Ring Gen Card, listed **below**). Connects to the trunk side of a key phone system and C.O. (Central Office) lines from a PBX. The FXO Card connects to the station side of a PBX or a loop start line from the Central Office.

T1-CB Cards		
4W E&M	MT410C	**$950.00**
FXS	MT411C	**$1150.00**
FXO	MT412C	**$1150.00**

T1-CB Bat/Ring Gen

If you have a T1-CB FXS Card (MT411C), you need this Card. It supplies power to activate the ringer.

T1-CB Bat/Ring Gen	MT430C	**$850.00**

Dual Modem Cards

Get two V.32 bis modems in one Card. Operate with up to 12 Cards in the T1 Channel Bank for a total of 24 modem lines. Choose async or sync and mix them as needed for optimum data integration. The top speed is 14.4 Kbps, but the Cards can fall back to 300 bps. You get support for Group III fax, V.25 autodialing, and password or callback security.

Dual Modem Cards		
14.4 Sync	MT425C	**$2100.00**
14.4 Async	MT426C	**$2000.00**

Add-On T1 Interface Cards and DSX-1 Drop-and-Insert Cards

T1 Interface Cards

Add ports for up to four T1 lines—for backup, or more DS0 channels. Only two links are active at one time. Order a Front Card *and* a CSU Rear Card for *each* line.

DSX1 Drop-and-Insert Cards

Set up your Drop-and-Insert link. Order a DSX-1 Rear Card, which has a connector for PBX, and a Front Card.

T1-CB Cards		
Front Card	MT440C	**$600.00**
CSU Rear	MT465C	**$1250.00**
DSX-1 Rear	MT441C	**$370.00**

Black Box Explains...

Frame Relay.

What Is It?

Frame Relay is a type of packet-based switching technology that has been streamlined for speed. It was developed to solve communication problems that other protocols could not: large bandwidth efficiency for clumping ("bursty") traffic, lower protocol processing, and high speeds.

What Does It Do?

Frame Relay provides a signal and data-transfer mechanism between the endpoints, or sites, of a network. It enables many users to share bandwidth, creating instantaneous bandwidth-on-demand ("BONDING"). It sends information in packets called frames. And each frame contains all the information necessary to route it to the correct destination. So in effect, each endpoint can communicate with many destinations over one access link to the network. And instead of being allocated a fixed amount of bandwidth, Frame-Relay traffic gets full bandwidth for short, "bursty" transmissions.

How Does It Work?

The Frame-Relay network contains user devices and network devices. The sending user device delivers the frames to the network. The network

Get Frame-Relay Connectivity for Your LAN

FrameRouter

The Low-Cost LAN-into-WAN Connectivity Solution!

- **LAN connectivity over Frame Relay.**
- **IP and IPX routing.**
- **SNMP manageable.**
- **Integral CSU/DSU or serial WAN links.**
- **Multiprotocol data compression.**

BLACK BOX
(412) 746-5500
Frame Router
RST
PWR
PORT 1
DATA
ERR
NETWORK
DATA
ERR
SUPV

Link your LANs affordably using inexpensive Frame Relay. The BLACK BOX® FrameRouter is the solution.

Connect your branch offices to your enterprise network. Get faster access to the Internet—or your own network. The FrameRouter gives you the power to do all this and save money on wide-area links—with just one convenient, inexpensive device.

The FrameRouter gives you the flexibility you need to connect your LANs together over whatever convenient, money-saving protocol you want: IP, SLIP, PPP, Telnet™, IPX™, RIP, SAP, ARP, and (of course) Frame Relay and X.25.

Addressing control gives you the option of controlling access to your network. You can establish a secure firewall—which allows only the connections you want and refuses all others.

The FrameRouter is available with a DSU for direct connection to digital services, or without a DSU if you already have one. Order the model that best suits your current system.

The FrameRouter is compatible with RS-232 or V.35 network protocols.

SPECIFICATIONS

Protocol — Network: Frame Relay, X.25, PPP;
User: SLIP, PPP async, IP, IPX, RIP, SAP, Telnet Terminal Client and Server, Frame Relay (concentration and switching)

Speeds — Ethernet: 10 Mbps;
DSU: 56 Kbps;
Serial (RS-232): Up to 128 Kbps sync, 115.2 Kbps async

Interface — MT730A: User Port: V.35 (RS-530) or RS-232 (strap-selectable); Composite Port: 56K DDS;
MT731A: User Port: V.35 (RS-530) or RS-232 (strap-selectable); Composite Port: V.35 (RS-530);
MT735A: User Port: Ethernet AUI and 10BASE-T; Composite Port: 56K DDS;
MT736A: User Port: Ethernet AUI and 10BASE-T; Composite Port: V.35 (RS-530);

All units include an RS-232 supervisor port using an RJ-45 female

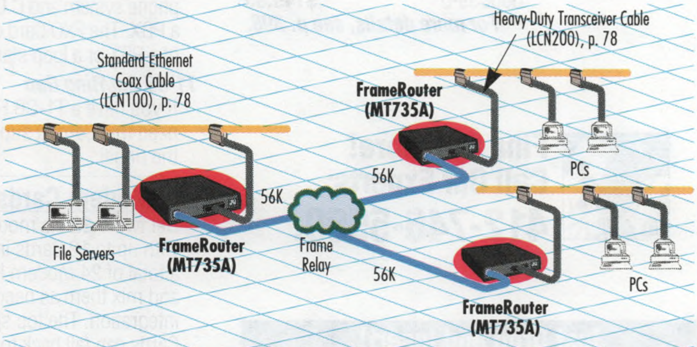
Connectors — MT730A: (1) DB25 female, (1) RJ-45 female, (1) RJ-48S;
MT731A: (2) DB25 female, (1) RJ-45 female;
MT735A: (1) DB25 female, (2) RJ-45 female, (1) AUI;
MT736A: (2) DB25 female, (1) RJ-45 female, (1) AUI

Power — 115/230 VAC, 60/50 Hz

Size — 1.5"H x 10"W x 7"D (3.8 x 25.4 x 17.8 cm)

Weight — Desktop Unit: 2 lb. (0.9 kg); Power Transformer: 1 lb. (0.5 kg)

FAXBACK INFO
Request Document Number: 13985
Call 412-746-5500
Anytime



Item	Code	Price
FrameRouter		
1S/DSU (One Serial Port, DSU Built-In)	MT730A	$975.00
1S (One Serial Port)	MT731A	$775.00
E/DSU (One Ethernet Port, DSU Built-In)	MT735A	$1475.00
E (One Ethernet Port)	MT736A	$1275.00
remember to order cables RS-530/V.35 Adapter Cable, 6-ft. (1.8-m)		
V.35 Male	EHN067-0006-MM	$39.45
V.35 Female	EHN067-0006-MF	$39.45
Heavy-Duty Transceiver Cable, 10-ft. (3.0-m)		
PVC	LCN200-0010	$55.95

For other lengths or plenum applications, see p. 78.

reads the addressing information on the frames and routes them to the proper destination user devices. Frame Relay assumes the data is error-free, which cuts out a time-consuming step in the processing protocol. Therefore, the data travels much faster than it would have with other older technologies. Any error correction is done by the user devices (PCs, routers).

What Are the Benefits?

There are many benefits of Frame Relay: lower internetworking costs—with multiple logical connections over a single physical connection, you get lower equipment costs and access costs *plus* better performance, more network access, and less network complexity.

What Equipment Do I Need?

Black Box has all the equipment you need to run Frame Relay. When used with a bridge or router and a CSU/DSU, our Frame-Relay Access Device Switches (Fradswitches, **pages 444 and 445**) send your data across your WAN and implement the Frame-Relay interface. Our FrameRouter (**page 442**) and FrameRouter+ (**below**) also give you quick access to the Internet. You can even get Frame-Relay connectivity for your legacy systems with the FrameRouter+.

If you're not sure which Frame-Relay device is best for your system, just call Tech Support at **412-746-5500, press 1,2,3** and get the expert help of our Communications Team.

and Your Existing Legacy Systems!

FrameRouter+

LAN and Existing Legacy Connectivity over the *Same* Frame-Relay Link!

- **LAN and existing legacy connectivity over Frame Relay.**
- **IP and IPX boundary routing.**
- **SNMP manageable.**
- **Integral CSU/DSU or serial WAN links.**
- **Supports SNA/SDLC and bisync protocols.**

Get all the advantages of our FrameRouter, *plus* Frame-Relay connectivity for your existing legacy systems—all over one link, all at the same time. Connect your existing equipment in your branch offices to compatible equipment in your home office, and keep your LANs connected, too. Get faster access to the Internet—or your own network. The FrameRouter+ gives you the power to do all this, *and* save money using Frame Relay—which is less expensive than private leased lines.

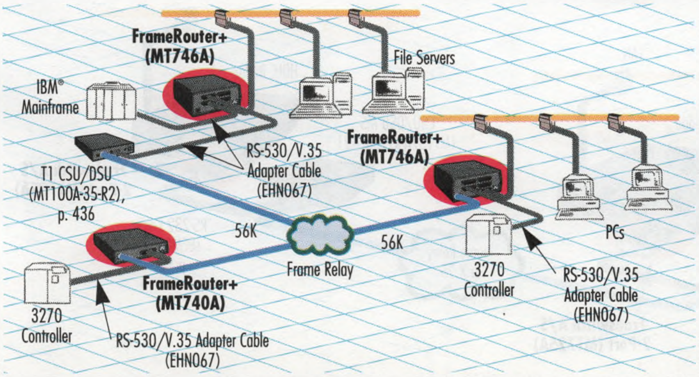
Addressing control gives you the option of controlling access to your network—allow only the connections you want and refuse all others. Perfect for firewall applications. Order the model that best suits your current system.

The **FrameRouter+ (1S)** series gives you basic RS-232 or V.35 LAN and legacy connectivity over most popular protocols with the option of an included DSU for maximum convenience.

The **FrameRouter+ (4S)** series gives you four RS-232 or V.35 ports for serial applications where you need maximum connectivity and a DSU option.

The **FrameRouter+ (4S/E)** series gives you four ports of the same powerful connectivity for your Ethernet LAN—and a DSU option.

FAXBACK INFO
Request Document Number: 13992
Call 412-746-5500
Anytime



SPECIFICATIONS

Protocol — Network: Frame Relay, X.25, PPP;
LAN: SLIP, PPP (async, sync, for IP, IPX™, RIP, SAP), Telnet™ Terminal Client and Server, Frame Relay (concentration and switching);
Legacy: Async, Burroughs® Poll/Select, SNA/SDLC, Bisync, Uniscope, HDLC, Annex G;
MT745A–MT746A, MT750A–MT751A: 10BASE-T or AUI Ethernet

Speeds — Ethernet: 10 Mbps; DSU: 56 Kbps;
Serial (RS-232): Up to 128 Kbps sync, 115.2 Kbps async

Interface — MT740A: (1) RS-232/V.35 user, (1) 56K DDS;
MT741A: (1) RS-232/V.35 user, (1) V.35 network;
MT750A: (4) RS-232/V.35 user, (1) 56K DDS;
MT751A: (4) RS-232/V.35 user, (1) V.35 network;
MT745A: (4) RS-232/V.35 user, (1) 56K DDS, (1) 10BASE-T, (1) AUI;
MT746A: (4) RS-232/V.35 user, (1) V.35 network, (1) 10BASE-T, (1) AUI;
All units include an RS-232 supervisor port

Connectors — MT740A: (1) DB25 F, (1) RJ-48S;
MT741A: (2) DB25 F;
MT750A: (4) DB25 F, (1) RJ-48S;
MT751A: (5) DB25 F;
MT745A: (4) DB25 F, (1) RJ-48S, (1) RJ-45, (1) AUI;
MT746A: (5) DB25 F, (1) RJ-45, (1) AUI;

Power — 115/230 VAC, 60/50 Hz

Size — MT740A–MT741A: 1.5"H x 10"W x 7"D (3.8 x 25.4 x 17.8 cm);
MT750A–MT751A, MT745A–MT746A: 3"H x 10"W x 7"D (7.6 x 25.4 x 17.8 cm)

Item	Code	Price
FrameRouter+		
1S/DSU (One Serial Port, DSU Built-In)	MT740A	**$1095.00**
1S (One Serial Port)	MT741A	**$895.00**
4S/DSU (Four Serial Ports, DSU Built-In)	MT750A	**$1995.00**
4S (Four Serial Ports)	MT751A	**$1795.00**
4S/E/DSU (Four Serial Ports, One Ethernet Port, DSU Built-In)	MT745A	**$2995.00**
4S/E (Four Serial Ports, One Ethernet Port)	MT746A	**$2795.00**
RS-530/V.35 Adapter Cable		
V.35 Male	EHN067-0006-MM	**$39.45**
V.35 Female	EHN067-0006-MF	**$39.45**

remember to order cables

X.25 Packet Assembler/Disassembler (X.25 PAD-8)

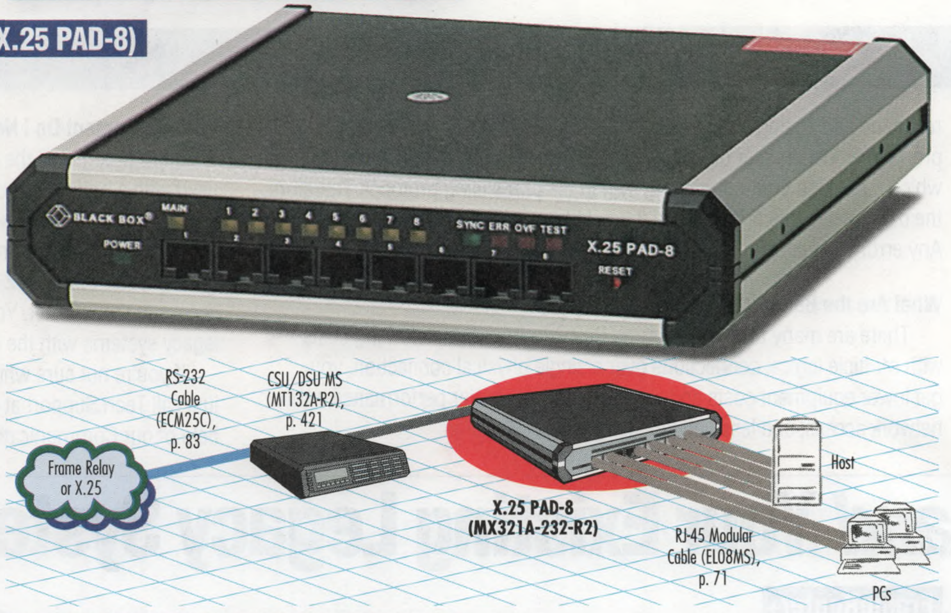
Connect Your Async Devices over X.25 *or* Frame Relay!

- **Easily migrate from X.25 to Frame Relay.**
- **Supports up to 8 async devices or ports.**
- **Async to 19.2 Kbps, sync to 2 Mbps!**
- **Four link interfaces available.**

Connect up to 8 async devices (like terminals and host ports) over Frame Relay and X.25 with the X.25 PAD-8. And now, Black Box has models available for RS-232, V.35, RS-422, and RS-530 link interfaces!

Frame Relay is a cost-effective alternative to X.25 packet-switching services. And our PAD-8s are excellent for systems migrating to Frame Relay, because they support both services.

Each channel can be configured independently for different users' specifications. The built-in management port simplifies configuration and diagnostics, and parameter storage is nonvolatile.


BLACK BOX®
MAIN
1 2 3 4 5 6 7 8
POWER
SYNC ERR OVF TEST
X.25 PAD-8
RESET
RS-232 Cable (ECM25C), p. 83
CSU/DSU MS (MT132A-R2), p. 421
Frame Relay or X.25
X.25 PAD-8 (MX321A-232-R2)
RJ-45 Modular Cable (EL08MS), p. 71
Host
PCs

FAXBACK INFORMATION
Request Document Number: 13569
Call 412-746-5500 Anytime

Item		Code	Price
X.25 PAD-8			
RS-232	115-VAC	MX321A-232-R2	**$1495.00**
	48-VDC	MX321A-232-D48	**$1495.00**
V.35	115-VAC	MX321A-35	**$1495.00**
	230-VAC	MX321AE-35	**$1495.00**
	48-VDC	MX321A-35-D48	**$1495.00**
RS-422	115-VAC	MX321A-36	**$1495.00**
	230-VAC	MX321AE-36	**$1495.00**
RS-530	115-VAC	MX321A-530	**$1495.00**

You may also need...

	Code	Price
CSU/DSU MS (**p. 421**)	MT132A-R2	**$725.00**
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

remember to order cables

For other lengths, see p. 83.
Specify gender when ordering.

SPECIFICATIONS

Clocking — External
Protocol — X.25: ITU X.25 LAPB; Frame Relay: CLLM, LMI, and ANSI PVC management; complies with ANSI T1.606, T1.617 Annex D, T1.618, and ITU recommendation Q.922 Annex A
Speed — Channel: Async up to 19.2 Kbps; Composite: Sync up to 2 Mbps
CE Approval — MX321A-232-D48, -35, -35-D48, -36, -530; 230-VAC versions: MX321AE-232-R2, -35, -36
Interface — MX321A-232-R2, MX321A-232-D48: RS-232; MX321A-35, MX321AE-35, MX321A-35-D48: V.35; MX321A-36, MX321AE-36: RS-422/V.36; MX321A-530: RS-530
Connectors — Channels: (8) RJ-45; Composite: DB25 female
Power — MX321A-232-R2, MX321A-35, MX321A-36, MX321A-530: 115 VAC, 60 Hz; MX321AE-35, MX321AE-36: 230 VAC, 50 Hz; MX321A-232-D48, MX321A-35-D48: 48 VDC

◆ ◆ ◆

Frame-Relay Access Device Switch A/S (Fradswitch A/S) 2-Port

Compact and High-Speed Frame-Relay Connections.

- **Multiprotocol switch for X.25, Frame-Relay, HDLC, and async devices.**
- **Supports sync 2-Mbps speeds, 4096-byte X.25 packets, 8-Kbps Frame Relay/HDLC packets.**
- **With free Doubler Cable, the async port connects two async devices to X.25 or Frame Relay.**

Give your non-packet-switched sync devices the packet-switching power of X.25 or Frame Relay! Our Fradswitches feature a built-in management agent for configuration, diagnostics, and compilation and updating of periodic statistics and status reports. And they use a funneling method to control congestion over Frame-Relay, so you avoid bottlenecks at peak traffic times.

The Fradswitches can also be used as two-port async FRADs, providing a link from two async devices to packet-switched services. Configure links to X.25, Frame-Relay, HDLC, or async protocols.

BLACK BOX
POWER
RESET

SPECIFICATIONS

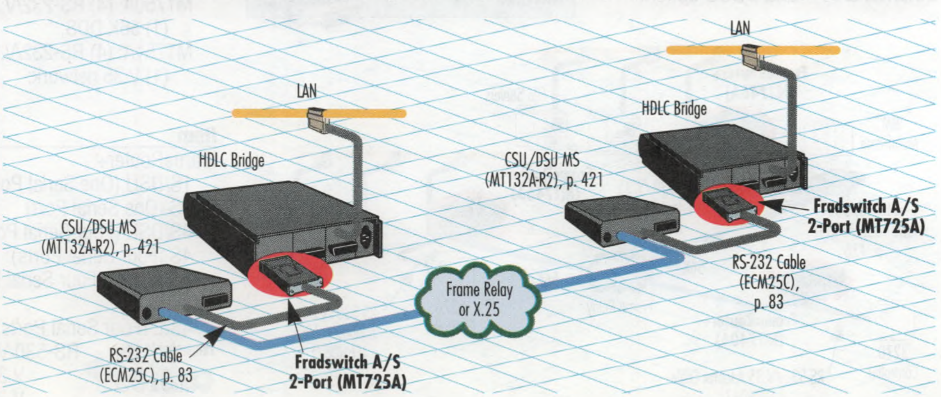
Protocol — HDLC, SDLC, X.25, Frame Relay, SNA/SDLC
Speed — MT723A, MT725A: Sync: Up to 64 Mbps, Async: Up to 38.4 Kbps; MT724A: Sync: Up to 2 Mbps, Async: Up to 38.4 Kbps
CE Approval — MT723A–MT724A; 230-VAC version: MT725AE
Interface — MT723A–MT724A: V.35; MT725A: RS-232
Connectors — (2) DB25 female
Power — 115-VAC wallmount supply (included)

FAXBACK INFORMATION
Request Document Number: 12465
Call 412-746-5500 Anytime

Item	Code	Price
Fradswitch A/S 2-Port		
V.35	MT723A	**$700.00**
V.35 HS	MT724A	**$700.00**
RS-232	MT725A	**$680.00**
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

remember to order cables

For other lengths, see p. 83.
Specify gender when ordering.


LAN
HDLC Bridge
CSU/DSU MS (MT132A-R2), p. 421
RS-232 Cable (ECM25C), p. 83
Fradswitch A/S 2-Port (MT725A)
Frame Relay or X.25
CSU/DSU MS (MT132A-R2), p. 421
LAN
HDLC Bridge
Fradswitch A/S 2-Port (MT725A)
RS-232 Cable (ECM25C), p. 83

Frame-Relay Access Device Switch A (Fradswitch A)

Now Send X.25 Packets over Frame Relay.

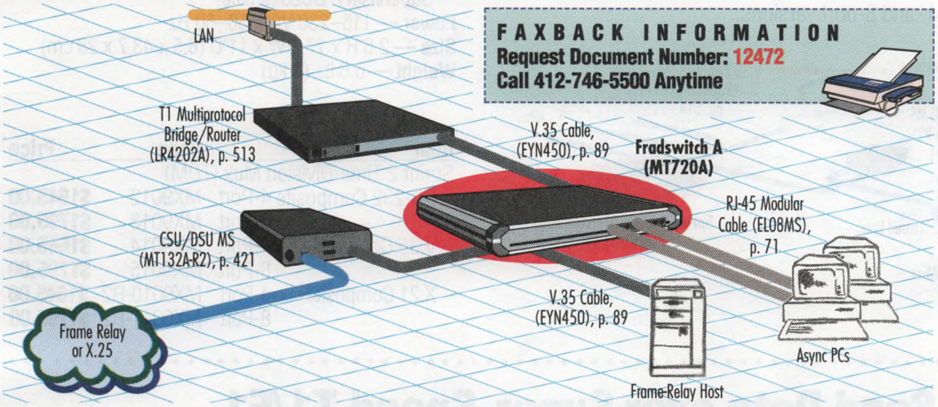
- **Aggregate sync speeds up to 2.15 Mbps.**
- **Integrates a FRAD/PAD and a three-port sync switch—get the performance of Frame Relay and X.25 packets *combined.***
- **The three sync ports support DTE or trunk connections.**

Your async site can access the speed and power of Frame Relay or X.25 with the Fradswitch A. Since it has a FRAD/PAD, you can run async data over a Frame-Relay network in X.25 packets for top speed, or without packeting. And you can use it to access X.25 networks.

The Fradswitch A is available in models with 8, 16, or 24 async channels to meet the needs of your site. Each model has three multiprotocol sync links and can packet-switch between all links. It supports just about any protocol you're likely to use, and it supports DTR-controlled X.25 dialup links.

The Fradswitch A makes network management easier with its built-in management agent for handling configuration and diagnostics. (All configuration settings are stored in nonvolatile memory.) And you can program it to compile and update statistics and status reports—automatically.

BLACK BOX
FRADSWITCH-8A


LAN
T1 Multiprotocol Bridge/Router (LR4202A), p. 513
V.35 Cable, (EYN450), p. 89
Fradswitch A (MT720A)
RJ-45 Modular Cable (EL08MS), p. 71
CSU/DSU MS (MT132A-R2), p. 421
V.35 Cable, (EYN450), p. 89
Frame Relay or X.25
Async PCs
Frame-Relay Host

FAXBACK INFORMATION
Request Document Number: 12472
Call 412-746-5500 Anytime

SPECIFICATIONS

Protocol — X.25, Frame Relay, HDLC, SDLC
Interface — Async ports: RS-232;
Sync ports: RS-232 or V.35
Connectors — (2) DB25 female, (1) DB15 female;
(1) 34-pin M-block; (1) DB37 female via adapter cable
Power — MT720A: 110, 115, or 230 VAC;
MT721A–MT722A: 90–265 VAC, 63–47 Hz, 20 watts
Size — MT720A: 1.7"H x 9.5"D x 17"W
(4.3 x 24.1 x 43.2 cm);
MT721A–MT722A: 1.7"H x 11.7"W x 17"D
(4.3 x 29.9 x 43.2 cm)
Weight — MT720A: 3.9 lb. (1.8 kg);
MT721A–MT722A: 5.3 lb. (2.4 kg)

Item	Code	Price
Fradswitch A (Async)		
RS-232 (Composite)		
8-Port	MT720A-232T	**$2200.00**
16-Port	MT721A-232T	**$3000.00**
24-Port	MT722A-232T	**$3800.00**
V.35 (Composite)		
8-Port	MT720A-35T	**$2200.00**
16-Port	MT721A-35T	**$3000.00**
24-Port	MT722A-35T	**$3800.00**
remember to order cables: V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**
For other lengths or genders, see p. 89.		
RJ-45 (8-Wire) Modular Cable, 7-ft. (2.1-m) Straight-Pinned	EL08MS-07	**$4.95**
For other lengths and pinnings, see p. 71.		

• • • • • • • • • • • •

Frame-Relay Access Device Switch A/S (Fradswitch A/S) 6- or 12-Port

BLACK BOX
FRADSWITCH-6 A/S
FRADSWITCH-12A/S

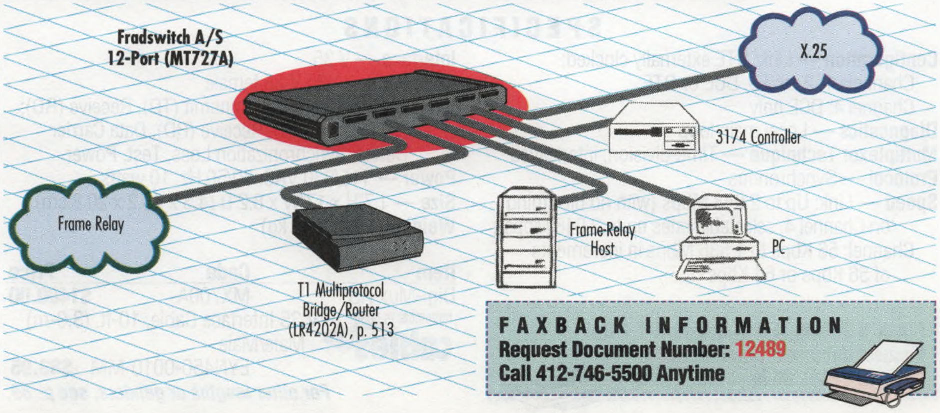
More Sync Ports for More Sync Power.

- **The 6- or 12-Port multiprotocol switch for X.25, HDLC, SNA/SDLC, and async devices.**
- **Customize sync ports for RS-232 or V.35 with DCE/DTE-selectable Interface Modules.**
- **Get 6 or 12 sync ports for aggregate speeds of up to 2.15 Mbps.**

Use Fradswitch A/S to interconnect six or twelve synchronous devices or packet-switched services (such as X.25 or Frame Relay) to create one logical, high-speed, easily managed Frame-Relay network.

Each Fradswitch A/S chassis includes two async ports for FRAD/Packet Assembler Disassembler (PAD) connectivity. Just fill in the remaining sync ports with the plug-in RS-232 or V.35 Interface Modules.

Network management, configuration, and diagnostics can be handled from any point on the network through an X.25 address, and you can program your Fradswitch A/S to generate and update statistics and status reports automatically. Connecting your system to Frame Relay couldn't be easier.


Fradswitch A/S 12-Port (MT727A)
X.25
3174 Controller
Frame Relay
Frame-Relay Host
PC
T1 Multiprotocol Bridge/Router (LR4202A), p. 513

FAXBACK INFORMATION
Request Document Number: 12489
Call 412-746-5500 Anytime

SPECIFICATIONS

Protocol — X.25, Frame Relay, SNA/SDLC, HDLC
Speed — Channel: Async: Up to 19.2 Kbps;
Sync: Up to 38.4 Kbps;
Composite: Up to 2.15-Mbps aggregate limit
CE Approval — MT726A–MT727A
Interface — RS-232 or V.35
Connectors — RS-232 Module: DB25 female;
V.35 Module: 34-pin M-block;
Async ports: RJ-45 female
Power — 90–265 VAC, 63–47 Hz, 30 watts
Size — 1.7"H x 17"W x 11.7"D (4.3 x 43.2 x 29.7 cm)

Item	Code	Price
Fradswitch-A/S Chassis		
6-Port	MT726A	**$1950.00**
12-Port	MT727A	**$3200.00**
Fradswitch-A/S Interface Modules		
RS-232	MT728C-232	**$100.00**
V.35	MT728C-V35	**$100.00**
remember to order cables: RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
For other lengths, see p. 83. Specify gender when ordering.		

CE Approved
EXCLUSIVE
BLACK BOX
(412) 745-5500
Sprint 2
TIME DIVISION MULTIPLEXOR

Sprint 2 Time-Division Mux (TDM)

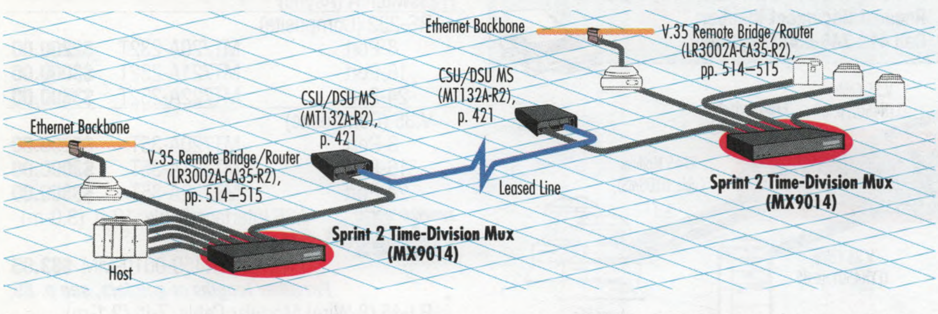
Here's *Real* Versatility in a Time-Division Mux.

- **4 or 8 RS-232 channels.**
- **Each channel separately configurable, sync or async up to 28.8 Kbps.**
- **Link rates up to 64 Kbps.**
- **CE approved for European use.**

The Sprint 2 Time-Division Multiplexor from Black Box provides maximum versatility for connecting up to eight data streams over a single leased line.

The Mux is fully CE approved for use in Europe and automatically adjusts to European 230-VAC power. It operates in both synchronous and asynchronous environments over 56-Kbps or 64-Kbps leased lines. And you can choose from RS-232, X.21, and V.35 models in both 4- and 8-port versions.

FAXBACK INFORMATION
Request Document Number: 16751
Call 412-746-5500 Anytime


Ethernet Backbone
V.35 Remote Bridge/Router (LR3002A-CA35-R2), pp. 514–515
CSU/DSU MS (MT132A-R2), p. 421
Host
Sprint 2 Time-Division Mux (MX9014)
Leased Line
CSU/DSU MS (MT132A-R2), p. 421
Ethernet Backbone
V.35 Remote Bridge/Router (LR3002A-CA35-R2), pp. 514–515
Sprint 2 Time-Division Mux (MX9014)

SPECIFICATIONS

Clocking — Internal and external
Diagnostics — Power-up self-test, local and remote loopbacks for both channel and composite
Operation — Sync or async
Speed — Channel: Async/Sync: 1.2 to 28.8 Kbps; Composite: 4.8 to 64 Kbps in 800-bps increments
Connectors — Channel: DB25 female; Composite: DB15 female; Supervisory: DB25 female
Power — 115–230 VAC, 50–60 Hz
Size — 2.6"H x 17.2"W x 11"D (6.5 x 43.7 x 28 cm)
Weight — 6.6 lb. (3 kg)

Item		Code	Price
Sprint 2 Time-Division Mux (TDM)			
RS-232 Composite	4-Port	MX9012	**$1645.00**
	8-Port	MX9013	**$1795.00**
V.35 Composite	4-Port	MX9014	**$1645.00**
	8-Port	MX9015	**$1795.00**
X.21 Composite	4-Port	MX9010-R2	**$1645.00**
	8-Port	MX9011-R2	**$1795.00**

* * *

Digi-Mux HS

Send Data over Super-Speed T1/E1 Digital Lines in Almost Any Environment—in Any Application.

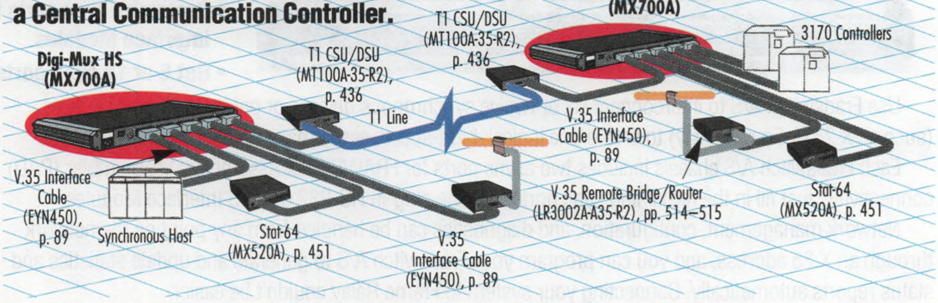
- **Works in any synchronous environment.**
- **2-, 3-, or 4-channel splitting for use in many applications.**
- **Works in both T1 and E1 systems.**
- **Add channels easily by cascading units.**

Here's the time-division multiplexor you've been waiting for. Share one super-fast T1 or E1 digital link with four 64-Kbps computers, controllers, muxes, or other devices.

Since this Mux features a data-transparent TDM bit-interleaved configuration, you can use it in any environment. Also, it splits the link rate into 2, 3, or 4 channels without overhead—giving you even more equipment-matching options. And you get more flexibility because this Mux doesn't have a CSU/DSU. That means you can mix and match equipment from many different vendors.

Set Channels 1, 2, and 3 independently to operate as DCE or DTE (switch-selectable), and you can connect a tail-end circuit directly to the Digi-Mux HS.

Four Remote-Control Units Linked to a Central Communication Controller.


Digi-Mux HS (MX700A)
T1 CSU/DSU (MT100A-35-R2), p. 436
T1 CSU/DSU (MT100A-35-R2), p. 436
Digi-Mux HS (MX700A)
3170 Controllers
T1 Line
V.35 Interface Cable (EYN450), p. 89
V.35 Interface Cable (EYN450), p. 89
Synchronous Host
Stat-64 (MX520A), p. 451
V.35 Interface Cable (EYN450), p. 89
V.35 Remote Bridge/Router (LR3002A-A35-R2), pp. 514–515
Stat-64 (MX520A), p. 451

SPECIFICATIONS

Configuration — Link: DTE externally clocked; Channels 1, 2, and 3, DCE or DTE; Channel 4: DCE only
Diagnostics — Local main loop
Multiplexor Technique — Time-division, interleaved
Protocol — Synchronous
Speed — Link: Up to 2.048 Mbps (with no bit-timing on Channel 4, selectable rates up to 2.048 Mbps); Channel: 56 Kbps to 1.536 Mbps in increments of 56 Kbps or 64 Kbps
Interface — V.35
Connectors — (5) V.35 female
Indicators — Channels: Transmit (TD), Receive (RD); Link: Transmit (TD), Receive (RD), Data Carrier Detect, Synchronization Loss, Test, Power
Power — 115/230 VAC, 60/50 Hz, 10 watts
Size — 1.7"H x 17"W x 8.2"D (4.3 x 43.2 x 20.8 cm)
Weight — 4.4 lb. (2 kg)

FAXBACK INFORMATION
Request Document Number: 14041
Call 412-746-5500 Anytime

Item	Code	Price
Digi-Mux HS	MX700A	**$1400.00**
remember to order cables: V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

For other lengths or genders, see p. 89.

2-Channel Async TDM

With This TDM, Two Async Terminals Share a Single Modem Port.

- **Channel data rates up to 9.6 Kbps.**
- **Full-duplex TDM with two independent channels.**
- **No external AC power needed.**
- **Fully interoperable with a range of equipment.**

Transmit and receive data simultaneously with the BLACK BOX® 2-Channel Async TDM—as two async terminals share one async modem or mux port.

The main channel operates at speeds up to 19.2 Kbps. Each subchannel can function at half this speed so you get user-selectable data rates up to 9.6 Kbps. Since this TDM is compatible with any async character formats using 5, 6, 7, or 8 data bits and 1 or 2 stop bits, it's interoperable with a variety of other products.

Power is derived from the data and control signals, so you don't need to use an external AC power source. And it's easy to install and use, so you'll be up and running in a matter of minutes.

SPECIFICATIONS

Multiplexor Technique — Time-division
Operation — Full-duplex
Speed — Subchannels: to 9.6 Kbps; Composite: to 19.2 Kbps
User Channels — 2
Connectors — Subchannels: DB25 female RS-232 Async DTE; Composite: DB25 female RS-232 Async DCE
Power— From data and control signals
Size — 1.2"H x 4.4"W x 7.3"D (3 x 11.2 x 18.5 cm)
Weight — 10 oz. (2.8 kg)

Item	Code	Price
2-Channel Async Time-Division Multiplexor (TDM)	MX625A	**$330.00**
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

remember to order cables

For other lengths, see p. 83. Specify gender when ordering.

Sync Multiplexor for Async Terminals (SMAT)

Use This TDM when Your Async Terminals Can't Use a Stat Mux.

- **A perfect match for asynchronous minicomputers.**
- **Mix different types of async equipment.**
- **Low power use with Split Speed.**
- **Transparent to bit or word structure.**

No transmission delays for data passing through this Mux! It works with computers, minicomputers, or any other async device. This unit is transparent to bit or word structure. And don't bother searching for more power outlets—innovative circuitry draws its power from control signals, rather than AC lines. Each SMAT subchannel uses half of the composite channel's data speed. If the composite channel runs at 38.4 Kbps, the subchannels can run at up to 19.2 Kbps.

SPECIFICATIONS

Multiplexor Technique — Time-division
Operation — Full-duplex
Speed — Subchannel: to 19.2 Kbps; Composite: to 38.4 Kbps
User Channels — 2
CE Approval — Yes
Interface — Subchannel and Composite: RS-232C
Connectors — Subchannel: (2) DB25 female; Composite: (1) DB25 female
Power — From data and control signals
Size — 1.2"H x 4"W x 7.3"D (3 x 10.3 x 18.5 cm)
Weight — 0.8 lb. (0.4 kg)

Item	Code	Price
Sync Multiplexor for Async Terminals (SMAT)	MX610A	**$510.00**
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

remember to order cables

For other lengths, see p. 83. Specify gender when ordering.

Nonpowered Synchronous Splitters

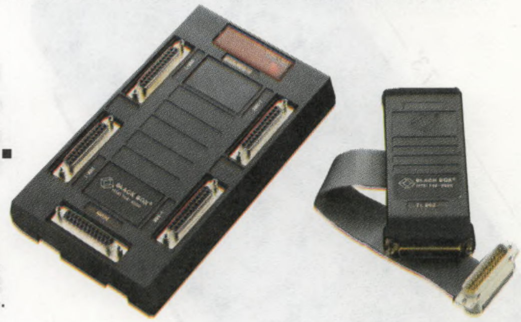
The Compact, Economical Way to Link up to Four Sync Terminals via One High-Speed Line.

- **Our lowest-cost time-division multiplexors.**
- **2- or 4-Channel models available.**

Use a pair of these Splitters to make one data line do the work of two or four costly sync leased lines. Each unit divides the composite line into subchannels. Just allocate the bandwidth—from 25% to 75%. Both support tail circuits. And if you link DTEs, the composite line runs up to 19.2 Kbps.

SPECIFICATIONS

Multiplexor Technique — Time division
Speed — Composite: Up to 19.2 Kbps
User Channels — 2 or 4
Interface — Channel: RS-232 4 sync; Composite: RS-232/V.24 sync
Connectors — Subchannel: (2) or (4) DB25 female; Composite: TL602A: (1) DB25 male; TL604A: (1) DB25 female
Power — From data and control signals
Size — TL602A: 1.2"H x 2"W x 5.3"D (3 x 5.1 x 13.5 cm); TL604A: 1.2"H x 4"W x 7.3"D (3 x 10.2 x 18.5 cm)
Weight — TL602A: 2 lb. (0.9 kg); TL604A: 7.5 lb. (3.4 kg)



Item	Code	Price
Nonpowered Synchronous Splitter		
2-Channel	TL602A	**$255.00**
4-Channel	TL604A	**$440.00**
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

remember to order cables

For other lengths, see p. 83. Specify gender when ordering.

MicroStat-2

Save the Cost of a Second Data Line! It's the Perfect Small-Office Solution.

- **Connect two async devices over a single dialup or leased-line modem link.**
- **Plugs directly into an RS-232 modem port.**
- **Multiplexes two subchannels up to 38.4 Kbps.**
- **Supports hardware and software flow control on all ports.**
- **Enhanced AT Command Set configuration.**
- **Status LED monitors communications link.**

Now you can virtually double the efficiency of your dialup or leased line modem link. The MicroStat-2 multiplexes two asynchronous channels—at data rates up to 38.4 Kbps—onto a single asynchronous link. And since both subchannels and the modem channel support these data rates, you can take full advantage of V.34 modem technology.

What's more, this device is designed to work with a variety of RS-232 hardware and software so you get end-to-end flow control and local and remote loopback tests.

The MicroStat-2 derives its power from the RS-232 device, so it doesn't need any outside AC power or batteries.

BLACK BOX
(412) 746-5500
MicroSTAT-2
PORT 1
PORT 2

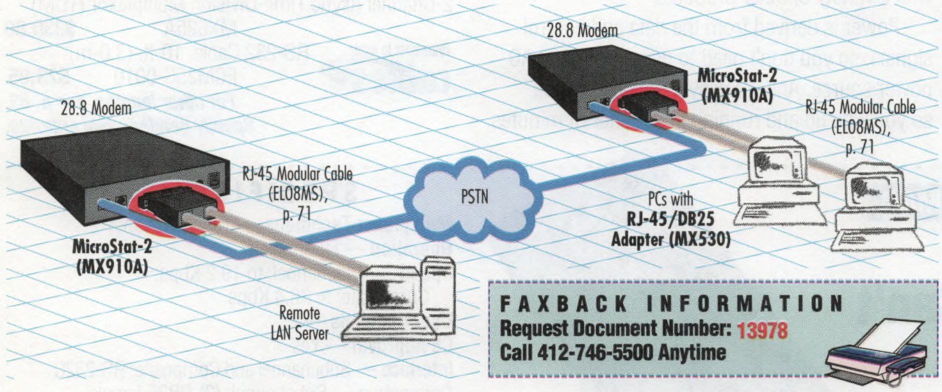
NOTE: Use one at each end of the line.

SPECIFICATIONS

Flow Control — X-ON/X-OFF, RTS/CTS
Multiplexor Type — Statistical
Speed — Subchannel: 110 bps to 38.4 Kbps; Composite: 1.2 to 38.4 Kbps
CE Approval — Yes
Interface — RJ-45, RS-232, asynchronous
Connectors — (2) RJ-45, (1) DB25 male
Power — From attached DCE device
Size — 2.2"H x 1.7"W x 0.8"D (5.6 x 4.3 x 2 cm)
Weight — 1 lb. (0.5 kg)

Item	Code	Price
MicroStat-2	MX910A	**$260.00**
You may also need:		
RJ-45/DB25 to DTE Adapter Kits		
Female	MX530	**$10.25**
Male	MX531	**$10.25**
remember to order cables RJ-45 (8-Wire) Modular Cable, 7-ft. (2.1-m), Straight-Pinned	EL08MS-07	**$4.95**

For other lengths and pinnings, see p. 71.


28.8 Modem
MicroStat-2 (MX910A)
RJ-45 Modular Cable (EL08MS), p. 71
PSTN
PCs with RJ-45/DB25 Adapter (MX530)
Remote LAN Server
28.8 Modem
RJ-45 Modular Cable (EL08MS), p. 71
MicroStat-2 (MX910A)

FAXBACK INFORMATION
Request Document Number: 13978
Call 412-746-5500 Anytime

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MiniStat-4

Four Goes into One—*Fast*—with This Compact Stat Mux.

7.3"
4"
BLACK BOX
MINI STAT - FOUR
MAIN

- **Four async channels.**
- **Channel speed up to 19.2 Kbps.**
- **Compact size.**
- **Hardware or software flow control.**

This value-priced Statistical Mux from Black Box provides user-selectable data rates for each subchannel, nonvolatile RAM for permanent configuration storage, and independent hardware/software flow control for each subchannel.

It multiplexes four asynchronous channels onto one synchronous link—at data rates up to 19.2 Kbps.

Built-in error detection and automatic data retransmission ensure that your data gets through—clean and correct, just as transmitted.

Use this Mux in matched pairs with sync modems. It's perfect for use with terminals. To connect printers, use a Statplex Multiplexor (MX611A) found on **page 449**.

SPECIFICATIONS

Speed — Channel: 300 bps to 19.2 Kbps; Composite: Up to 19.2 Kbps
CE Approval — Yes
Interface — Channel: RS-232, async; Composite: RS-232, sync
Connectors — DB25 female
Power — Wallmount power supply: 115 VAC, 60 Hz (230-VAC version on request)
Size — 1.2"H x 7.3"W x 4"D (3 x 18.5 x 10.2 cm)
Weight — 0.8 lb. (0.4 kg)

Item	Code	Price
MiniStat-4	MX865A	**$625.00**
Send data up to 19.2 Kbps over a dialup data line with… Modem 32144 (**p. 408**)	MD833A-R5	**$795.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

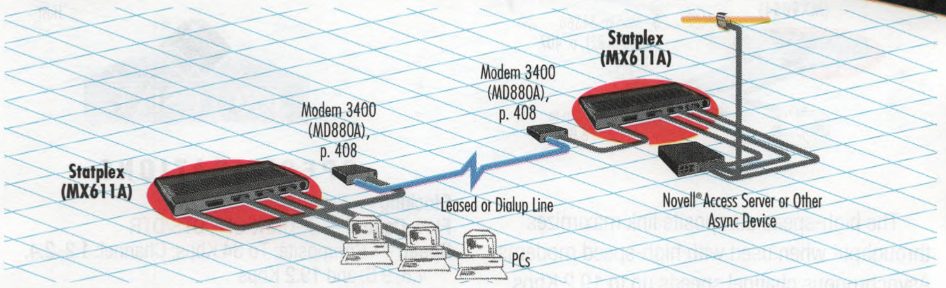
For other lengths, see p. 83.
Specify gender when ordering.

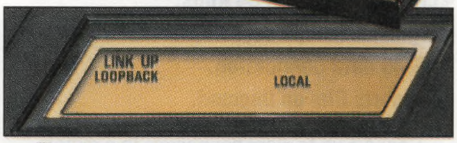
Statplex

This Flexible Mux Fits Any Async Application—and Your Budget!

- **Use one sync line to connect up to *eight* PCs or terminals to your Novell server!**
- **Interconnect remote hosts, terminals, printers—all over one line. Program channels for specific hosts.**

TECH SUPPORT'S PRODUCT OF CHOICE
BLACK BOX


Statplex (MX611A)
Modem 3400 (MD880A), p. 408
Modem 3400 (MD880A), p. 408
Statplex (MX611A)
Leased or Dialup Line
Novell® Access Server or Other Async Device
PCs


LINK UP
LOOPBACK
LOCAL

The easy-to-read, front-panel LCD window shows system status and channel activity. LEDs indicate power on and alarm conditions.

Statplex uses just one low-cost sync line to connect up to eight PCs or terminals to your Novell® access server. You get low-cost, easy remote access to Hewlett-Packard®, DEC™ VAX™, Tandem®, Data General, and other hosts.

Monitor the entire system, including composite link status, from an async terminal or Statplex's front-panel LCD. Security is two-level password-protected and can be set for individual channels.

SPECIFICATIONS

Speed — Channel: Up to 9600 bps;
Composite: Up to 19.2 Kbps
CE Approval — All items listed are approved
Interface — Channel: RS-232 async;
Composite: RS-232, sync
Connectors — Channel: DB25 female;
Composite: DB25 male
Power — 115 VAC, 60 Hz, 40 watts
Size — MX611A: 1.3"H x 12.6"W x 9.8"D (3.3 x 32 x 24.9 cm);
MX622A: 2"H x 12.6"W x 9.8"D (5.1 x 32 x 24.9 cm)
Weight — 4-Port: 2.5 lb. (1.1 kg); 8-Port: 3 lb. (1.4 kg)

FAXBACK INFORMATION
Request Document Number: 10535
Call 412-746-5500 Anytime

Item	Code	Price
Statplex 4-Port	MX611A	**$895.00**
8-Port	MX622A	**$1095.00**
To complete the connection, we recommend:		
Modem 3400 (**p. 408**)	MD880A	**$895.00**
remember to order **cables** ***For DB25 connections, order:***		
RS-232 Cable, 5-ft. (1.5-m) Male/Female	ECM25C-0005-MF	**$20.95**

For other lengths and genders, see p. 83.

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Modular Statistical Multiplexors

Low-Cost UTP Cable and Modular Connectors Make These Muxes Easy to Install and a Great Bargain.

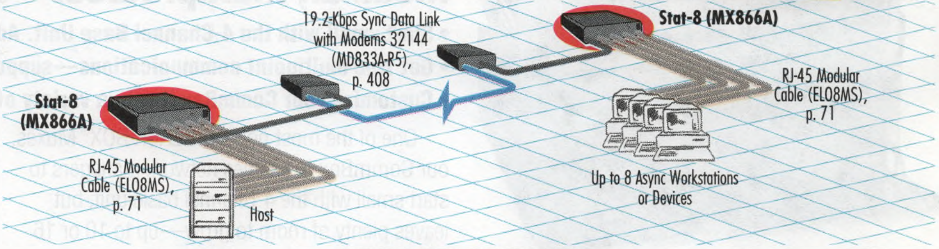
- **Fits any installation—4, 8, even 24 ports.**
- **All modular, all the time. Use low-cost twisted-pair cable and RJ connectors.**
- **Async data zips over a 19.2-Kbps sync link.**

These compact, rackmountable Muxes from Black Box have RJ-45 connectors for fast plug-in terminal connections. Each port has user-selectable hardware/software so you can connect a variety of async devices.

Access these Muxes from any subchannel to manage configuration and diagnostics. With the software commands, you can pass parameters downline from the local mux for easy remote configuration. Entries are password-protected.

Use the Muxes in pairs. The composite interface must operate in Sync Mode.

FAXBACK INFORMATION
For Stat-4 and -8: 11842,
For Stat-24: 11859,
Call 412-746-5500 Anytime


19.2-Kbps Sync Data Link with Modems 32144 (MD833A-R5), p. 408
Stat-8 (MX866A)
Stat-8 (MX866A)
RJ-45 Modular Cable (EL08MS), p. 71
RJ-45 Modular Cable (EL08MS), p. 71
Host
Up to 8 Async Workstations or Devices

SPECIFICATIONS

Multiplexor Technique — Statistical
Speed — Channel: Stat-4 and Stat-8: 300 bps to 19.2 Kbps; Stat-24: 75 bps to 38.4 Kbps;
Composite: All models, up to 19.2 Kbps
CE Approval — 230-VAC versions: MX864AE, MX866AE, MX868AE
Interface — RS-232; Channel: Async;
Composite: Sync
Connectors — Channel: RJ-45 female;
Composite: (1) DB25 male
Power — 115 VAC, 60 Hz (230-VAC version on request)
Size — MX864A, MX866A: 1.7"H x 8.5"W x 9.5"D (4.3 x 21.6 x 24.1 cm);
MX868A: 1.7"H x 17.2"W x 9.6"D (4.3 x 43.7 x 24.4 cm)

Item		Code	Price
Modular Statistical Multiplexors	Stat-4	MX864A	**$795.00**
	Stat-8	MX866A	**$1100.00**
	Stat-24	MX868A	**$2150.00**
For fast analog transmissions over dialup lines, order…			
Modem 32144 (**p. 408**)		MD833A-R5	**$795.00**
remember to order **cables** RJ-45 (8-Wire) Modular Cable, 7-ft. (2.1-m) Straight-Pinned		EL08MS-07	**$4.95**

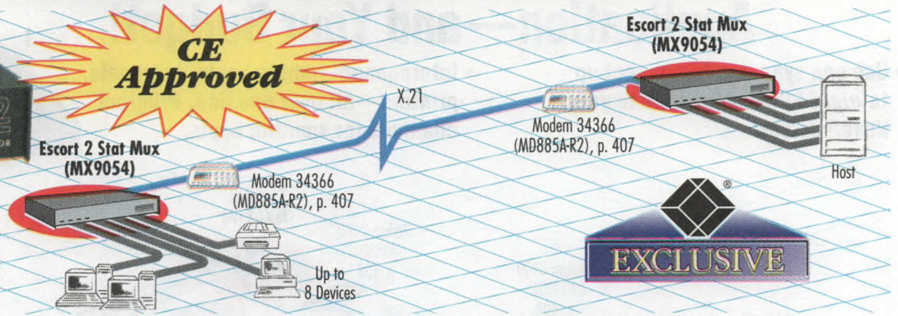
For other lengths and pinnings, see p. 71.

Escort 2 Stat Mux

Connect up to Eight Async Peripherals to a Remote Host.

BLACK BOX
(412) 746-5500
Escort 2
STATISTICAL MULTIPLEXOR

CE Approved



EXCLUSIVE

- **Link speeds up to 34 Kbps.**
- **Eight 19.2-Kbps async data channels.**
- **RS-45 data connection.**
- **Supports Dial on Demand.**

Connect up to eight peripherals to a remote host over a dialup, ISDN, or leased-line link via an Escort 2 Statistical Multiplexor and a modem or CSU/DSU. The Mux also supports Dial on Demand just like its larger cousin, the Express Stat Mux, **page 451**.

The high-speed composite link maximizes throughput when used with high-speed modems. Asynchronous channel speeds up to 19.2 Kbps can be statistically multiplexed to give a maximum aggregate composite speed of 1.536 Mbps.

Check Out How You Can Save!

The "old" way:	*Cost*	*The Black Box way:*	*Cost*
8 Leased Lines	*$1600.00 per month*	*1 Leased Line*	*$200.00 per month*
16 Leased-Line Modems	*$4770.00*	*2 Leased-Line Modems and 2 Escort 2 Stat Muxes*	*$4380.00*

Save $390 in equipment costs! plus! Save $1400 in line costs each month!

Get an instant return on your investment!

These rates are for comparison only and may vary. Contact your local telephone company for actual rates.

SPECIFICATIONS

Clocking — External
Flow Control — X-ON/X-OFF, CTS/DTR
Speed — Composite: To 34 Kbps; Channel: 1.2, 2.4, 4.8, 9.6, and 19.2 Kbps
CE Approval — All items listed are approved
Interface — MX9052: RS-232; MX9053: V.35; MX9054: X.21
Connectors — Composite: DB15 (F); Supervisory: DB25 (F); Channels: RJ-45 (F)
Power — 115–230 VAC, 50–60 Hz
Size — 2.6"H x 16.9"W x 11"D (6.5 x 43 x 28 cm)

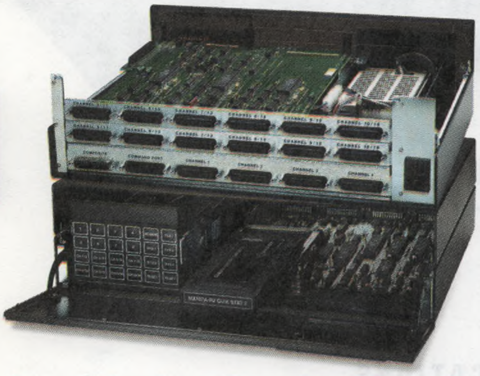
FAXBACK INFORMATION
Request Document Number: 16737
Call 412-746-5500 Anytime

Item	**Code**	**Price**
Escort 2 Stat Mux		
RS-232 Composite	MX9052	**$1195.00**
V.35 Composite	MX9053	**$1195.00**
X.21 Composite	MX9054	**$1195.00**
You may also need...		
Modem 34366 (**p. 407**)	MD885A-R2	**$995.00**

remember to order cables *Call Tech Support to be sure you order the right cable.*

Communication Box II

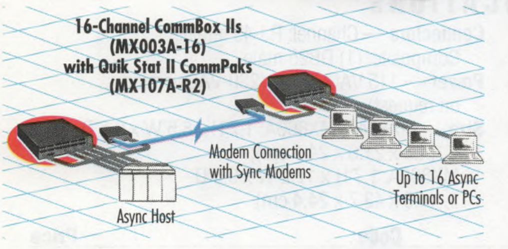
The Perfect Mux for Growing Enterprises. Modular, Multiprotocol—Add On as Business Grows.



- **Start small with the 4-Channel Base Unit. Add modules as network demand increases.**
- **Get *true* multipoint communications—support up to 16 terminals *in eight locations!***
- **Customize your CommBox II with a variety of CommPak Cartridges.**

One of the most popular BLACK BOX® Muxes, our CommBox II, enables network managers to start small with the 4-Channel basic unit, but leaves plenty of room to grow—up to 10 or 16 channels—with the optional Expansion Cards. And add-on CommPak Cartridges offer even more opportunity to customize.

The Enhanced Stat Mux CommPak supports DEC™, DG Prime®, Tandem®, HP® ENQ/ACK, and WANG®. Quik Stat II compresses data for 70% more throughput. The X.25 Async PAD merges up to 16 terminals on one X.25 trunk. The Multi-Master and Multi-Node CommPaks support multipoint links.



SPECIFICATIONS

Speed — Channel: Async, up to 9600 bps; Composite: Sync, up to 19.2 Kbps
Interface — Channel: RS-232, async; Composite: RS-232, async or sync
Connectors — Channel: DB25 (F); Composite: DB25 (M)
Power — 115–230 VAC, 60–50 Hz, 75.4 watts
Size — 4.5"H x 15.5"W x 11.8"D (11.4 x 39.4 x 30 cm); Rackmount Kit: 5.3"H x 19"W x 11.5"D (13.5 x 48.3 x 29.2 cm)
Weight — 8 lb. (3.6 kg)

Item	**Code**	**Price**
Communication Box II (Requires One CommPak Cartridge from Those Listed Below)		
4-Channel (Base Unit)	MX003A-4	**$1490.00**
10-Channel (Base Unit plus Expansion Card)	MX003A-10	**$2740.00**
16-Channel (Base Unit plus Two Expansion Cards)	MX003A-16	**$3990.00**
6-Port Expansion Card	MX105-C	**$1250.00**
Communication Pak (CommPak) Cartridges		
Enhanced Statistical Multiplexor	MX100A	**$200.00**
Quik Stat II CommPak	MX107A-R2	**$200.00**
X.25 Asynchronous PAD (Packet Assember/Disassembler)	MX104A	**$300.00**
Multi-Master (Must Use External Modem)	MX102A	**$300.00**
Multi-Node (Must Use External Modem)	MX103A	**$200.00**
remember to order cables RS-232 Cable, 5-ft. (1.5-m) M/F	ECM25C-0005-MF	**$20.95**

For other lengths, see p. 83.

Express Stat Mux

Connect up to 16 Devices to a Remote Host over a High-Speed ISDN or Leased Line.

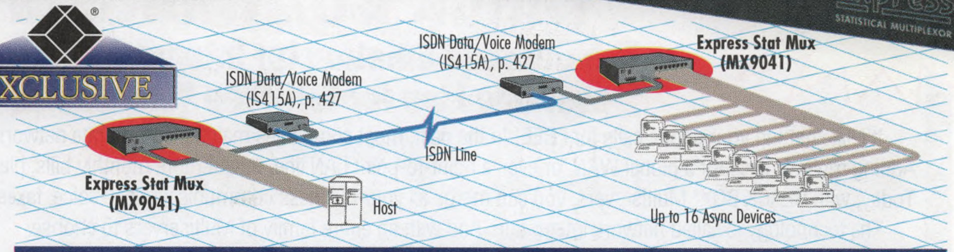
CE Approved
BLACK BOX
Express
STATISTICAL MULTIPLEXOR

- **Composite link rate to 64 Kbps.**
- **16 19.2-Kbps async data channels.**
- **Supports Dial on Demand.**
- **Leased-line or dialup-line compatible.**

EXCLUSIVE

Connect up to 16 asynchronous devices over a single line! The Express Stat Mux supports Dial on Demand: It will raise DTR lead to signal the DCE equpment to dial a preset number. After a specified period of inactivity, the Mux will drop DTR to signal the DCE device to hang up. This means savings for you!

The Express Stat Mux is compatible with both digital leased lines and analog dialup lines. Channel buffering and data compression maximize throughput. Also, it's 64-Kbps compatible, so it can be used overseas.

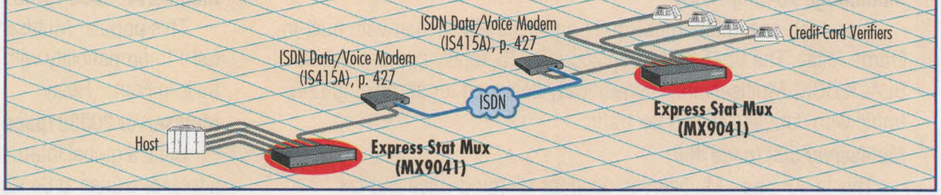

ISDN Data/Voice Modem (IS415A), p. 427
ISDN Data/Voice Modem (IS415A), p. 427
Express Stat Mux (MX9041)
ISDN Line
Host
Express Stat Mux (MX9041)
Up to 16 Async Devices

FAXBACK INFORMATION
Request Document Number: 16720
Call 412-746-5500 Anytime

Black Box Explains...

ISDN Mux Applications.

An ISDN line is ideal for data collection from a device such as a point-of-sale system or a credit-card verifier. With our Express Stat Mux, many such devices can share a single ISDN line.


ISDN Data/Voice Modem (IS415A), p. 427
Credit-Card Verifiers
ISDN Data/Voice Modem (IS415A), p. 427
ISDN
Express Stat Mux (MX9041)
Host
Express Stat Mux (MX9041)

SPECIFICATIONS

Clocking — External
Flow Control — X-ON/X-OFF, CTS/DTR
Speed — Composite: 9600 bps to 64 Kbps; Channel: 1200, 2400, 4800, and 9600 bps, 19.2 Kbps
CE Approval — All items listed are approved
Interface — MX9041: RS-232; MX9042: V.35; MX9039: X.21
Connectors — Composite: DB15 (F); Supervisory: DB25 (F); Channels: RJ-45 (F)
Power — 115–230 VAC, 60–50 Hz
Size — 3.5"H x 17.2"W x 14.2"D (9 x 43.7 x 36 cm)
Weight — 13.2 lb. (6 kg)

Item	Code	Price
Express Stat Mux		
RS-232 Composite	MX9041	**$1795.00**
V.35 Composite	MX9042	**$1795.00**
X.21 Composite	MX9039	**$1795.00**
You may also need...		
ISDN Data/Voice Modem	IS415A	**$399.95**

remember to order cables ***Call Tech Support to be sure you order the right cable.***

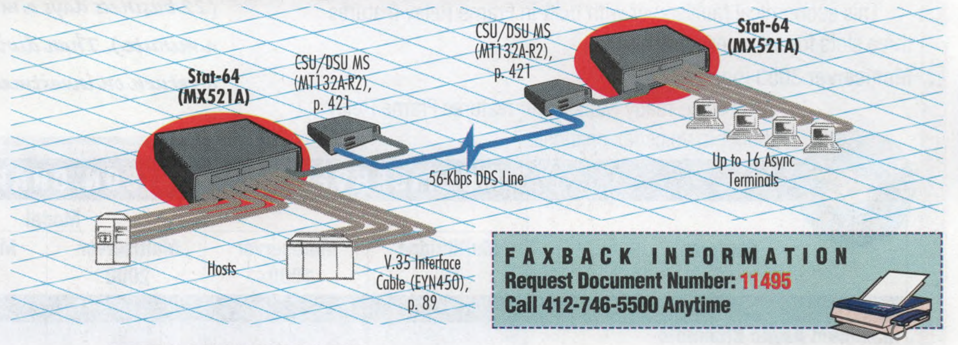
◆ ◆ ◆

Stat-64

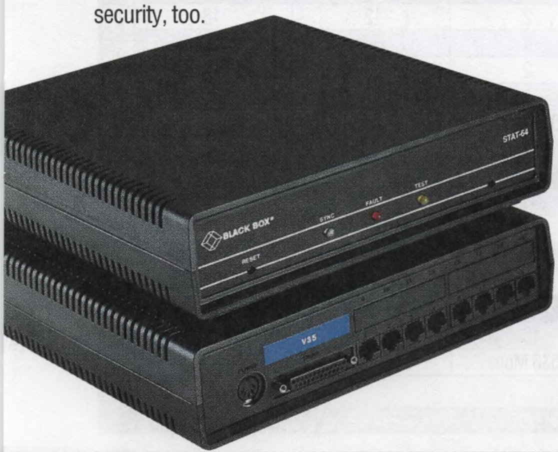
Link up to 16 Devices over One High-Speed DDS Line.

- **You choose where to send data: any port on a remote Stat-64, not just matching ports.**
- **Works with popular, low-cost 56-Kbps digital leased lines.**

Get high-speed V.35 performance and full multiplexing for your async equipment. It has a V.35 interface for your composite data channel—it's literally built for use with a DDS line (or a high-speed V.34 modem link). You can toggle back and forth between two sessions. Or switch between ports on the remote system. And you get network security, too.


CSU/DSU MS (MT132A-R2), p. 421
Stat-64 (MX521A)
Stat-64 (MX521A)
CSU/DSU MS (MT132A-R2), p. 421
56-Kbps DDS Line
Up to 16 Async Terminals
Hosts
V.35 Interface Cable (EYN450), p. 89

FAXBACK INFORMATION
Request Document Number: 11495
Call 412-746-5500 Anytime


STAT-64
BLACK BOX
SYNC
FAULT
TEST
RESET
V35

SPECIFICATIONS

Data Format — Channel: Asynchronous, ASCII; Composite: Synchronous, HDLC
Diagnostics — Local and remote loopback for all ports and trunk lines
Flow Control — X-ON/X-OFF or hardware
Multiplexor Technique — Statistical
Speed — Channel: 75 bps to 19.2 Kbps; Composite: Up to 64 Kbps
CE Approval — MX522C; 230-VAC versions: MX520AE–MX521AE
Interface — Channel: RS-232, DCE; Composite: V.11/V.35, DTE
Power — Wallmount power supply: 115 VAC, 60 Hz (230-VAC version on request)
Size — 2.5"H x 9.7"W x 10.1"D (6.4 x 24.6 x 25.7 cm)
Weight — 3 lb. (1.4 kg)

Item	Code	Price
Stat-64		
8-Port (Expandable to 16)	MX520A	**$1095.00**
16-Port	MX521A	**$1695.00**
8-Port Expander Card	MX522C	**$795.00**
To DTE/Adapter Kit		
Female	MX530	**$10.25**
Male	MX531	**$10.25**
To DCE/Adapter Kit		
Male	MX532	**$10.25**
You may also need...		
CSU/DSU MS (**p. 421**)	MT132A-R2	**$725.00**
V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

remember to order cables

For other lengths or genders, see p. 89.

Now with Built-In Frame Relay!

Black Box Multiservers

The Ultimate Solution for Integrating Voice and Data over One Line for Toll-Free Telecommunications.

It's like getting your phone calls for FREE! In the past, most companies maintained separate networks for voice and data communication. Adding multiple lines for a global WAN, or even a point-to-point LAN line, meant more monthly bills, plus all new hardware to connect those lines. Today, with BLACK BOX® Multiservers, you can merge all your business communications—voice, faxes, data—onto just one line.

The technology is called network integration. And with an entire family of Multiservers to choose from, Black Box is clearly the source for integrated solutions—and colossal savings. To learn more about Multiserver solutions, just read on. Then get ready to save! Most Multiservers now also have built-in Frame-Relay support, so you can take advantage of the flexibility and economy of one of the most versatile technologies available today.

FAXBACK INFORMATION
For Multiserver Overview
Request Document Number: 12939
Call 412-746-5500 Anytime

Introducing the Multiserver Family of Voice/Data Multiplexors:

Multibridge 75 (page 453)

It's a high-speed Ethernet Router and it's a Multiserver with built-in Frame Relay. The BLACK BOX® Multibridge 75, totally compatible with BLACK BOX® Multiservers, is specifically designed for combining LAN traffic with data, voice, and fax traffic.

Multiserver 500 (page 460)

This is our basic Multiserver, used for merging voice and fax traffic onto existing data lines between two sites. Unlike the rest of the Multiserver family, it's not upgradable for Ethernet traffic or compatible with Frame Relay.

Multiserver 1000+ (page 455)

This economical Multiserver is intended for linking two sites with limited voice, fax, and data traffic. This basic unit has many features you're looking for: built-in Frame Relay and expandability to up to four voice/fax channels and 26 async data channels.

Multiserver 2000 (page 455)

This economical Multiserver with built-in Frame Relay features three slots for future expandability.

Multiserver 3000 (page 456)

The voice-ready Multiserver features Frame Relay and built-in voice/fax channels.

Multiserver 5000 Turbo Pro (page 454)

This popular Multiserver connects your PBX to a T1 line. It includes full T1 compatibility with digital voice compression and also features built-in Frame Relay.

Multiserver 20000 (page 456)

Build a global internetwork—with up to 12 interconnect links for a total of 6 lines at 64 Kbps. Or pair it with another Multiserver 20000 for a super high-speed bus between two networks. Or create a high-density network node. This Multiserver is the right choice for applications requiring top speed and flexibility. And it has built-in Frame Relay.

Check Out How You Can Save!

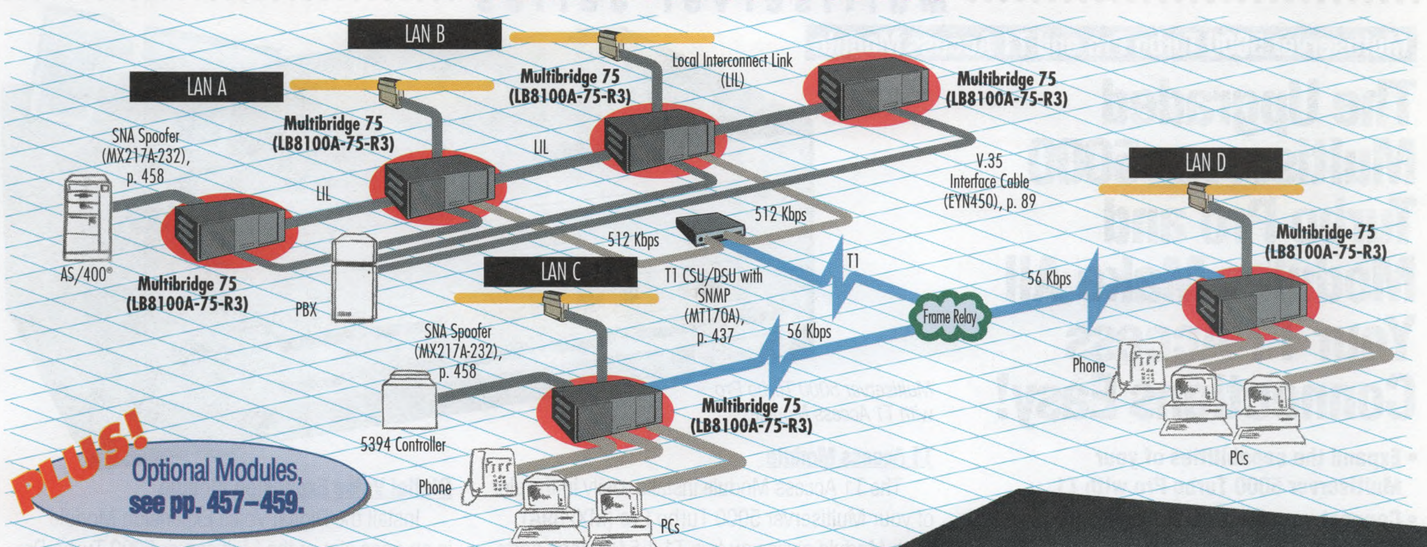
Buy a 2-channel Multiserver 3000 now, and it'll pay for itself before your next summer vacation! How? Simply divide $2950.00 (product's cost) by 165 (22 business days a month x 75 minutes of use a day x $0.10 a minute). Then divide the result by 2 (channels). That's a return on investment in less than 9 months!

BUYER'S GUIDE

MULTISERVER COMPARISON CHART

Features	Model					
	Multibridge 75	Multiserver 1000+	Multiserver 2000	Multiserver 3000	Multiserver 5000 Turbo Pro	Multiserver 20000
Ports						
Maximum Async Channels	27	41	29	26	41	41
Maximum Sync Channels	1	1	1	2	12	18
Maximum Voice/Fax Channels	4	4	4	4	30*	8
Built-In Voice/Fax Channels	0	0	0	2	0	12
T1 Voice Compression Option					✓	
Integrated Router Module	Built-In	Optional	Optional	Optional	Optional	Optional
Remote Terminal Server Module Option	✓	✓	✓	✓	✓	✓
WAN Links						
Maximum WAN Links	1	1	1	1	3	6
Maximum Backup Links	1	1	1	1	2	6
Maximum WAN Link Speed	64 Kbps	64 Kbps	64 Kbps	128 Kbps	128 Kbps	128 Kbps
T1 Drop & Insert					✓	
Frame Relay						
Maximum PVCS	32	32	32	48	64	128
Maximum Access Rate	640 Kbps	640 Kbps	640 Kbps	1.536 Mbps	1.536 Mbps	1.536 Mbps

*With T1 Voice Option


LAN A
LAN B
LAN C
LAN D
Multibridge 75 (LB8100A-75-R3)
Multibridge 75 (LB8100A-75-R3)
Multibridge 75 (LB8100A-75-R3)
Multibridge 75 (LB8100A-75-R3)
Multibridge 75 (LB8100A-75-R3)
Multibridge 75 (LB8100A-75-R3)
Local Interconnect Link (LIL)
LIL
LIL
SNA Spoofer (MX217A-232), p. 458
SNA Spoofer (MX217A-232), p. 458
AS/400®
PBX
512 Kbps
512 Kbps
T1 CSU/DSU with SNMP (MT170A), p. 437
T1
56 Kbps
56 Kbps
Frame Relay
V.35 Interface Cable (EYN450), p. 89
Phone
Phone
PCs
PCs
5394 Controller

PLUS! Optional Modules, see pp. 457–459.

Multibridge 75

Add FREE Voice and Fax to Your LAN Traffic with This LAN-Ready Frame-Relay Bridge.

BLACK BOX
MULTISERVER BRIDGE 1000

- **Compatible with Frame-Relay networks.**
- **Save money by integrating voice and data with Frame Relay.**
- **It's the single-box way to add Frame Relay to your LAN—especially if you have a bridge or need to add one.**
- **Transparent bridging.**
- **TCP/IP and Novell® IPX™ routing.**
- **Enhanced bus and software for optimized speed.**
- **Built-in flash technology simplifies software updates.**

Maximum Integration. Only from Black Box.

It's called integrated internetworking. The BLACK BOX® Multibridge 75 uses EasyRouter™ Technology (ERT) to multiplex voice, data, and fax over a single Frame-Relay link. And—as if that weren't enough—it's an Ethernet Router, too. It does all this so efficiently, it's hard to remember you're using just one leased line. Really!

Maximum Throughput.

Get transparent LAN connectivity plus voice and fax communication—over the same line. The Multibridge 75 from Black Box is an expandable, LAN-ready Frame-Relay Access Device (FRAD).

With Frame Relay, adding voice and fax transmissions over your line is less likely to degrade your WAN performance. That's because LAN, voice, and data traffic travel in short, quick bursts.

About half of voice and fax transmission is silence, which uses no bandwidth. So if you set your voice/fax channel to, say, 9.6 Kbps, you'd use only about 4 Kbps of bandwidth. Even if your daily voice/fax transmissions average two hours, you'd see only a 1 to 2% traffic increase on a 64-Kbps link—not enough to affect performance.

And the modular construction of the Multibridge 75 makes it easy to choose the functions you need for your WAN—data, voice, fax, and more.

Maximum Savings.

Of course the phone company would like you to keep throwing your hard-earned money its way. But now you don't have to. Save money every month: Use just one line, not four, with the BLACK BOX® Multibridge 75.

FAXBACK INFORMATION
Request Document Number: 12702
Call 412-746-5500 Anytime

SPECIFICATIONS

Data Compression — All LAN data, up to 6:1; TCP/IP and LAT™ headers, up to 10:1, All non-LAN data, up to 4:1

Filtering — Automatic filtering on destination address; Additional configurable filters: broadcast, multicast, source address, protocol type

Protocols Supported — Protocol-independent

Speed — Sync and async data: 2.4 to 38.4 Kbps; Filtering: 10,000 pps; Forwarding: Up to 6 times WAN speed

CE Approval — All items listed are approved

Interface — Ethernet: Jumper-selectable for standard or Thin Ethernet; may be adapted to 10BASE-T with external transceiver;
WAN: Connector interface: DB25 female, EIA 232 (ITU V.24/28); serial sync; internal/external clocking; full-duplex

Power — 90–265 VAC, 47–63 Hz, 135 watts

Size — 4.4"H x 17.5"W x 12"D (11.2 x 44.5 x 30.5 cm)

Item	Code	Price
Multibridge 75 Includes: Base Unit, CommPak, and Integrated Router Module	LB8100A-75-R3	**$1950.00**
M/S Voice Fax Module		
1-Channel	MX236C-1	**$1200.00**
2-Channel	MX236C-2	**$1800.00**
Interface Cards:		
E&M	MX402A	**$450.00**
FXO	MX404A	**$450.00**
FXS	MX407A	**$450.00**
MS 56K CSU/DSU		
Single-Channel	MT150C	**$495.00**
Dual-Channel	MT152C	**$795.00**

To customize your Multibridge, see our complete listing of Optional Multiserver Modules on pp. 457–459.

remember to order cables

See our MultiServer Cables on p. 458.

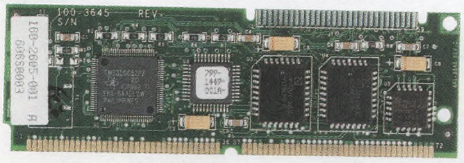
Multiserver 5000 Turbo Pro and T1 Access Module

The Upgraded Multiserver 5000 Turbo Pro and Modules Make All Your T1 Access Connections Easy!

Multiserver 5000 Turbo Pro with T1 Access Module.

- **Expand the capabilities of your Multiserver 5000 Turbo Pro with T1.**
- **Connect your Multiserver directly to the T1 port of your PBX.**
- **Full drop-and-insert capability.**
- **Functions similar to a channel bank.**
- **Built-in Frame Relay.**

We've upgraded our popular Multiserver 5000 Turbo Pro to support T1 Cards. Now you can use a Multiserver to connect your PBX to a T1 line—without a channel bank! The Multiserver will compress and send up to 18 voice channels over your T1 line and still leave plenty of bandwidth for other traffic—anything from video to LAN.



Digital Voice Card (MT050C)

T1 Access Module

The T1 Access Module installs easily in the slot of your Multiserver 5000 Turbo Pro (MX239A). Each Module gives you two T1 1.544-Mbps ports (one DS1/CSU and one DSX) and six expansion slots. Install Digital Voice Cards in the slots of the T1 Access Module to add up to six voice channels. Drop-and-insert capability smoothly integrates new channels onto your T1 line.

Digital Voice Card

Each Digital Voice Card fits into a slot on the T1 Access Module and adds voice compression for a single T1 voice subchannel. The T1 Access Module can accommodate up to six Digital Voice Cards. By adding a Digital Voice Expansion Module, you can install up to 18 Digital Voice Cards for each T1 Access Module. And each voice channel uses only 2 to 8 Kbps of your T1 bandwidth—leaving the rest for your other transmissions. Save when you buy a package of six.

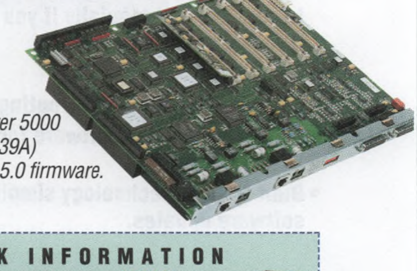
Digital Voice Expansion Module

Install the Digital Voice Expansion Module in an open slot of the Multiserver 5000 Turbo Pro. The Digital Voice Expansion Module can accommodate 12 Digital Voice Cards in addition to the six installed in the slots of the T1 Access Module.

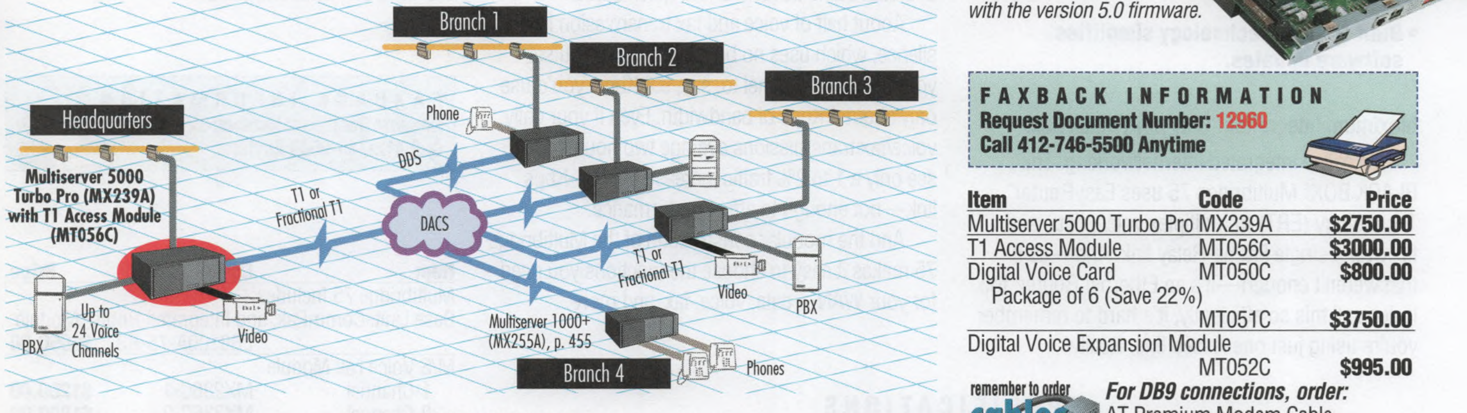
For Complete Multiserver Specifications…

See the **facing page** for operating specs on our entire line of Multiserver voice/data multiplexors.

PLUS! Multiserver Modules, **see pp. 457–459.**



T1 Access Module (MT056C)
Exclusively for the Multiserver 5000 Turbo Pro (MX239A) with the version 5.0 firmware.



FAXBACK INFORMATION
Request Document Number: 12960
Call 412-746-5500 Anytime

Item	Code	Price
Multiserver 5000 Turbo Pro	MX239A	**$2750.00**
T1 Access Module	MT056C	**$3000.00**
Digital Voice Card	MT050C	**$800.00**
Package of 6 (Save 22%)	MT051C	**$3750.00**
Digital Voice Expansion Module	MT052C	**$995.00**

remember to order **cables**

For DB9 connections, order:
AT Premium Modem Cable 10-ft. (3.0-m) EVMBMC-0010 **$19.95**
For other lengths, see p. 109.

For DB25 connections, order:
RS-232 Cable, 10-ft. (3.0-m) ECM25C-0010 **$23.95**
For other lengths, see p. 83.
Specify gender when ordering.

For composite connections, order:
Crossover Cable, Male-to-Male EZ423-0015 **$26.00**

SPECIFICATIONS

T1 Access Module:
Data-Port Speed — N x 56/64 to 512 Kbps
DSO Assignment — User-selectable
Framing — D4, ESF
Line Code — AMI, B8ZS
TDM Port Clocking — Internal and loop
T1 Transmit Timing — External (DS-1 or DSX-1), internal
Interface — T1 (1.544 Mbps)
Connectors — RJ-48C

Digital Voice Card:
Group 3 Fax Rates — 2.4, 4.8, 7.2, and 9.6 Kbps
Hardware — 72-pin SIMM module
Voice Compression Rate — 4.0, 4.8, 7.2, 8.0, 9.6, 12.0, 14.4, 16.0 Kbps
Voice Output Attenuation — 25 dB

Digital Voice Expansion Module:
Digital Voice Module Slots — 12
See facing page for Multiserver specifications.

Multiserver Series

Multiserver 1000+

Our Most Popular Multiserver Is Now Frame-Relay Compatible!

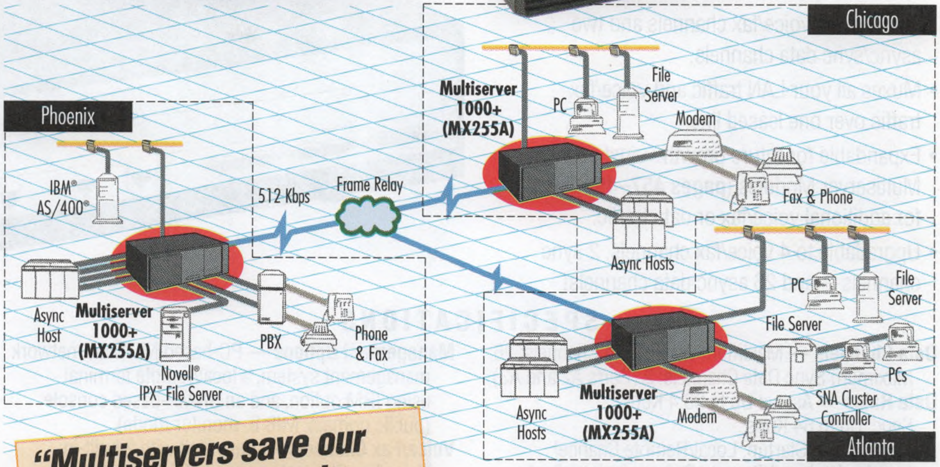
- **Ideal for point-to-point sites with limited traffic.**
- **Up to 64-Kbps speed.**
- **Merges voice, data, and LAN traffic on one line.**
- **Five expansion slots for optional modules.**

Our most popular Multiserver now includes Frame Relay! Even if you're presently not using Frame Relay, you can be prepared to take advantage of its flexibility and cost advantages with the economical Multiserver 1000+ when you do upgrade. (See "Black Box Explains the Frame-Relay Advantage" on **page 524**.)

The Multiserver 1000+ is intended for use between two sites at data rates of up to 64 Kbps. Like our other Multiservers, this unit merges voice, data, and LAN traffic onto one line, saving you the cost of multiple lines and multiple termination hardware.

This unit supports many of the same high-tech features as our more robust Multiservers—such as Voice/Rate Adaption and fast-packet multiplexing. It can also be customized for various interface connections with the optional Modules listed on **pages 457–459**.

PLUS! Multiserver Modules, **see pp. 457–459.**



> **"Multiservers save our company thousands of dollars every year!"**

FAXBACK INFORMATION
Request Document Number: 12953
Call 412-746-5500 Anytime

SPECIFICATIONS

CE Approval — MX256A-R3

Item	Code	Price
Multiserver 1000+	MX255A	**$1500.00**
For toll-quality conversations over less bandwidth...		
MS CommPak (5.1)	MX256A-R3	**$250.00**

remember to order cables The Multiserver 1000+ uses the same cables as the Multiserver 5000 Turbo Pro (see **facing page**).

◆ ◆ ◆

Multiserver 2000

An Economical Multiserver—with Built-In Frame Relay!

PLUS! Expansion Modules, **see p. 458.**

- **Three expansion slots for optional Modules.**

With the BLACK BOX® Multiserver 2000, you get a modular integration multiplexor that provides integrated data, voice, fax, and LAN access *plus* bridging/routing in a single unit. And you get built-in Frame-Relay capability—all in a very economical package!

The Multiserver 2000 is highly versatile for voice and fax. It features Group III fax demodulation, performs voice/fax switching, and digitizes and compresses voice.

Multiserver 2000 also performs async and sync data compression and handles asynchronous data switching and contention. It can even act as an Ethernet remote bridge/router and remote terminal server.

FAXBACK INFORMATION
Request Document Number: 14003
Call 412-746-5500 Anytime

MULTISERVER SPECS (ALL MODELS)

Channel Speeds — Up to 38.4 Kbps async; 1200 bps to 19.2 Kbps sync or DLC with internal/external clocking
Data Channels — 5 (expandable to 41)
Data Format — Base unit only: Channel: 5 async or 4 async/1 sync; Composite: Sync, internal/external clocking, full-duplex
Diagnostics — Channel: Local/remote channel loopback, local/remote channel output, local sync channel loopback; Composite: Remote composite loopback, local system loopback
Flow Control — X-ON/X-OFF (configurable per channel end), and CTS/DTR; HP® ENQ/ACK, Tandem®, WANG®
Multiplexor Technique — MicroBand ATM™
CE Approval — All items listed are approved
Interface — Channel and composite: RS-232,V.24, V.28
Power — 115/230 VAC, 60/50 Hz, 135 watts
Size — 6.5"H x 17.5"W x 12.5"D (16.5 x 44.5 x 31.8 cm)
Weight — 22 lb. (10 kg)

Item	Code	Price
Multiserver 2000	MX250A	**$1900.00**
Multiserver 2000 CommPak	MX251A-R2	**$250.00**

remember to order cables The Multiserver 2000 uses the same cables as the Multiserver 5000 Turbo Pro (see **facing page**).

Multiserver Series

Multiserver 3000

Voice-Ready with Frame Relay!

MULTISERVER 3000
BLACK BOX
VOICE PORT E1
E & M
FXS/FXO
VOICE PORT E2

- Built-in Frame Relay supports T1 speeds—up to 1.544 Mbps! Maximum leased-line speeds to 128 Kbps.
- Two built-in voice/fax channels and two async/sync data channels.
- Muxes all your LAN traffic and voice/fax traffic over one leased line.
- Expandable for future growth—just add Multiserver Modules (**pages 457–459**) for additional voice/fax or data traffic.
- Upgradable to 4 voice/fax channels, 2 sync channels—and 26 async data channels!

SPECIFICATIONS

Data Channels — Maximum Async Data Channels: 26; Maximum Sync Data Channels: 2 (Ports A2 and A3)

Data Rates — Async: Up to 38.4 Kbps; Sync: Up to 64 Kbps

Diagnostics — Startup, Local/Remote Channel Loopbacks, Local/Remote Composite Loopbacks

Flow Control — EIA (RTS/CTS, DTR/DSR), X-ON/X-OFF, HP® ENQ/ACK, Tandem, WANG®, and Data General

Management Options — PC-based NETMan™ network management system, a local/remote terminal using IRM option, and an SNMP-based console (public domain, MIB II, monitor mode)

Voice/Fax Channels — Base Unit with 2 built-in Voice/Fax Channels supports CEPT L1 (AC15) and RON/TRON

Size — 4.4"H x 17.4"W x 11.8"D (11.2 x 44.2 x 30 cm)

Weight — 13 lb. (5.9 kg)

FAXBACK INFORMATION
Request Document Number: 16012
Call 412-746-5500 Anytime

Item	Code	Price
Multiserver 3000	MX261A-R3	**$2986.00**

remember to order cables ***Different applications require different cables. Call Tech Support to be sure you order the right one.***

Multiserver 20000

Create Your Own Global Network with Our Best Multiserver!

- **Built-in Frame Relay.**
- **Enables up to 12 interconnected links for a total of 6 lines at 64 Kbps.**
- **Creates a high-speed bus to another local Multiserver 20000.**

With the Multiserver 20000, you can build a WAN of up to 12 remote sites. Local interconnect links can communicate at up to 256 Kbps for high-performance traffic handling at the central site.

As a network node, the Multiserver 20000 acts as a high-density central office hub for integrated networks composed of hundreds of data and voice/fax channels. It handles most async and sync protocols including IPX™/SPX, TCP and IBM® SNA/SDLC.

BLACK BOX
(412) 746-5500
MULTISERVER 20000

SPECIFICATIONS

Data Rates — Async: Up to 38.4 Kbps; Sync: Up to 64 Kbps

Diagnostics — Startup, Local/Remote Channel Loopbacks, Local/Remote Composite Loopbacks

Flow Control — EIA (RTS/CTS, DTR/DSR), X-ON/X-OFF, HP ENQ/ACK, Tandem, WANG, and Data General

Management Options — PC-based NETMan™ network management system, a local/remote terminal using IRM option, and an SNMP-based console (public domain, MIB II, monitor mode)

Voice/Fax Channels — Voice/Fax Expansion Modules: TUVM, UVM, VM, IVM, DVM, including fax option

CE Approval — All items listed are approved

Size — 10.8"H x 17.5"W x 12"D (27.3 x 44.5 x 30.5 cm)

Weight — 27 lb. (12 kg)

FAXBACK INFORMATION
Request Document Number: 12984
Call 412-746-5500 Anytime

Item	Code	Price
Multiserver 20000	MX240A	**$4950.00**
For toll-quality conversations over less bandwidth, order the firmware below...		
Multiserver 20000 CommPak 5.0	MX241A-R4	**$2500.00**

See pages 457–459 for Multiserver Modules.

MS Turbo Voice/Fax Modules

Enhanced Voice Cards Deliver the Superior Clarity of Toll-Line Phone Calls—without the Tolls!

- **Fit all Multiserver base units.**
- **Near-toll clarity over as little as 8 Kbps of bandwidth.**
- **Multiplex one or two voice/fax lines onto your data line—and start saving!**
- **Process analog signals from a fax machine.**
- **Supports the G.729 ITU standard for digital voice compression.**
- **Interface Cards provide direct connection.**
- **FXO Interface Card recognizes power disconnection from the supervisor.**
- **Compatible with v5.0 or higher.**

Want to multiplex one or two voice/fax traffic lines onto your data line? You can with either the Single- or Dual-Slot MS Turbo Voice/Fax Modules!

Just plug a Module into your Multiserver, and you can improve the quality of your voice and fax communications. And you'll also see your remote communications costs decline.

Better Bandwidth.

The MS Turbo Modules are ClearVoice ready. And ClearVoice technologies increase bandwidth efficiency, which enable you to put *more* data and voice traffic over your Multiserver links. In addition, ClearVoice technologies enable voice switching, fax/modem demodulation, echo cancellation, and reduced network delay.

Digitize to Economize.

With the MS Turbo Modules, an advanced G.729 voice-compression algorithm and Adaptive Differential Pulse Code Modulation (ADPCM) enable you to transmit near-toll quality voice over as little as 8 Kbps of bandwidth compared to the standard 32 Kbps. By combining high-quality voice with a low digitizing rate, bandwidth is freed up to support additional voice/fax and data traffic.

They Always Check the Fax.

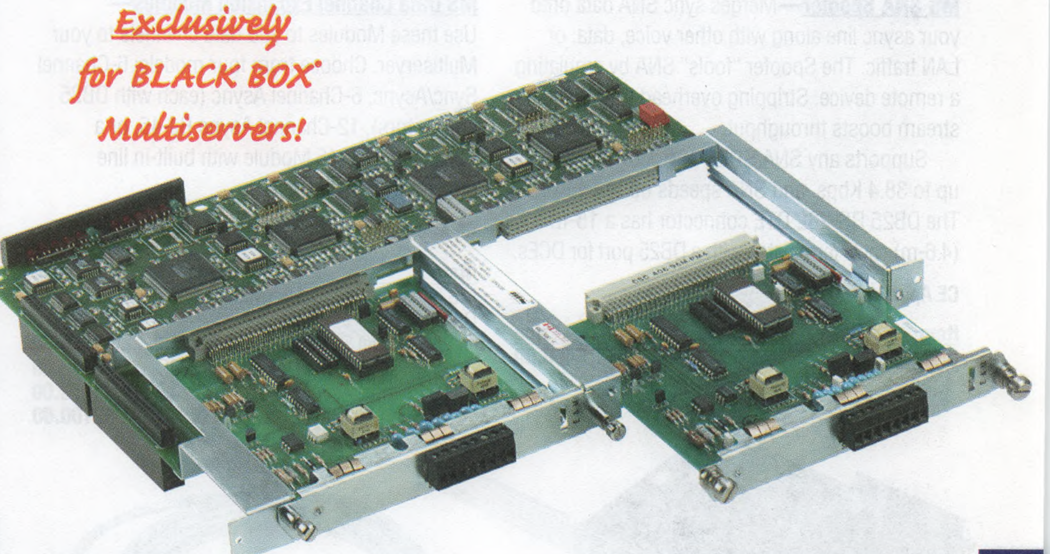
The Turbo Modules can also process analog signals obtained from a fax machine. Firmware constantly monitors the incoming analog stream for fax signals. If there is no voice on the channel and fax signals are detected, the firmware automatically switches the voice channel from the voice mode into the fax mode.

The digitizing rate of a Turbo Module channel may be configured independently for fax as well as for voice. While in the fax mode, the analog signals will be digitized at the rate configured for fax. Then when the channel returns to the voice mode, the analog signals will be digitized at the rate configured for voice.

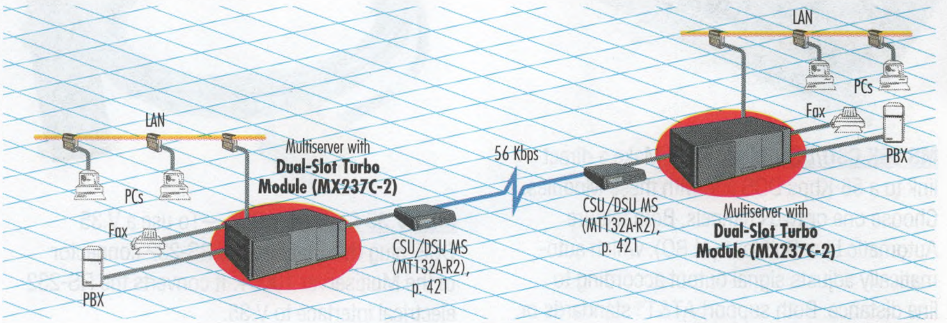
Black Box Deals the Cards, Too.

Order one Module and then one or two Interface Cards (depending on the number of channels on the Module) to provide the premise interface for your voice/fax hardware. The E&M Card connects to your PBX or switching system, the FXO Card links to Central Office switch, and the FXS Card links directly to your phone or fax.

Modules fitted with an FXO Card recognize power disconnect supervision. This feature enables an FXO-fitted voice/fax channel to connect to any other Turbo Module voice/fax channel, including FXO, E&M, and FXS.



Exclusively for BLACK BOX® Multiservers!


LAN
PCs
Fax
PBX
Multiserver with Dual-Slot Turbo Module (MX237C-2)
CSU/DSU MS (MT132A-R2), p. 421
56 Kbps
CSU/DSU MS (MT132A-R2), p. 421
Multiserver with Dual-Slot Turbo Module (MX237C-2)
LAN
PCs
Fax
PBX

SPECIFICATIONS

Channel Connector — RJ-11 female, 10 post terminal block
Enhanced Interfaces — E&M Types I & II and V, FXS Loopstart, FXO Loopstart
Number of User Channels — 1 or 2
CE Approval — All items listed are approved
Connectors — Requires one of the three optional Interface Cards listed at right: E&M, FXO, FXS
Indicators — OK, LO, RO, LS, RS, TM
Power — From the Multiserver interface

Item	Code	Price
First order one MS Turbo Module...		
Single-Slot	MX237C-1	**$1200.00**
Dual-Slot	MX237C-2	**$1800.00**
Then, order one or two Interface Cards, depending on the number of channels the Module supports...		
E&M	MX402A	**$450.00**
FXO	MX404A	**$450.00**
FXS	MX407A	**$450.00**
remember to order cables RJ-11 (6-Wire) Modular Cable, 4-ft. (2.1-m) Straight-Pinned	EL06MS-04	**$2.95**

For other lengths and pinnings, see p. 71.

FAXBACK INFORMATION
Request Document Number: 13796
Call 412-746-5500 Anytime

Multiserver Series

Optional Modules for Multiserver 1000+, 2000, 3000, 5000 Turbo Pro, and 20000

The Power of Multiservers Is All in the Cards!

Use this wide array of optional Modules and Cards to populate your BLACK BOX® Multiserver chassis with just the right combination of data/voice interface connections and termination hardware such as the integral CSU/DSU. Customize any Multiserver to match your application perfectly.

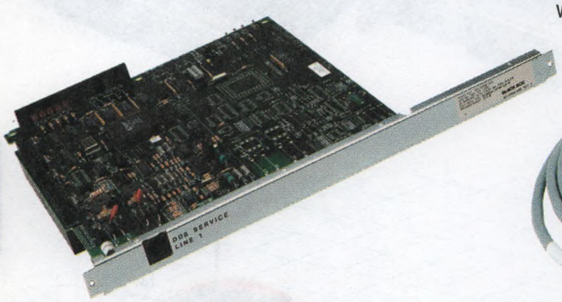
PLUS! Multiserver Voice/Fax Modules, **see p. 457.**

MS SNA Spoofer—Merges sync SNA data onto your async line along with other voice, data, or LAN traffic. The Spoofer "fools" SNA by emulating a remote device. Stripping overhead from the data stream boosts throughput.

Supports any SNA/SDLC protocol, line speeds up to 38.4 Kbps, and SNA speeds up to 64 Kbps. The DB25 RS-232 DTE connector has a 15-ft. (4.6-m) cable terminated with a DB25 port for DCEs.

CE Approval — Yes

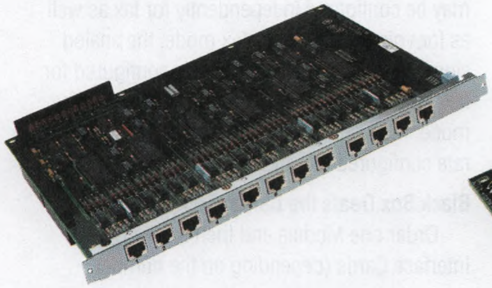
Item	Code	Price
SNA Spoofer	MX217A-232	**$450.00**



MS 56K CSU/DSU Modules—Make a direct link to a 56-Kbps DDS line with these Modules. Choose one or two channels. Both feature Automatic Line Buildout (ALBO), which automatically adjusts signal output according to line distance. Both support AT&T® standards or equivalents for DDS. And both offer full diagnostics and support full-duplex sync operation. Connectors include (1) RJ-45 pinned to RJ-48 specs and (1) 4-wire terminal block.

CE Approval — All items listed are approved

Item	Code	Price
MS 56K CSU/DSU Modules		
Single-Channel	MT150C	**$495.00**
Dual-Channel	MT152C	**$795.00**



MS Data Channel Expansion Modules—Use these Modules to add data channels to your Multiserver. Choose from four models: 6-Channel Sync/Async, 6-Channel Async (each with DB25 connectors), 12-Channel Async RJ-45, or a 12-Channel RJ-45 Module with built-in line driver for extra distance.

CE Approval — All items listed are approved

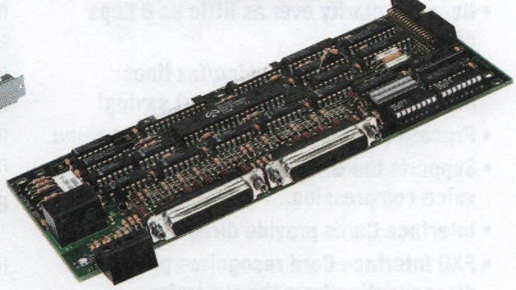
Item	Code	Price
MS Expansion Modules (Multiserver 5000 Turbo Pro Only)		
6-Channel Sync/Async	MX215C	**$1150.00**
Async Only	MX222C	**$995.00**
12-Channel Async RJ-45	MX223C	**$1950.00**
with Line Driver	MX224C	**$2100.00**

MS1 V.35 Converter/DCE—To use a V.35 DCE, plug this unit into the RS-232 connector of the Multiserver 1000+. It converts the RS-232 electrical interface to V.35.

CE Approval — Yes

Item	Code	Price
MS1 V.35 Converter/DCE	MX226-R2	**$400.00**

PLUS! These Modules Fit in the BLACK BOX® Multiserver Family of Data/Voice Multiplexors Shown on **pp. 452–456.**

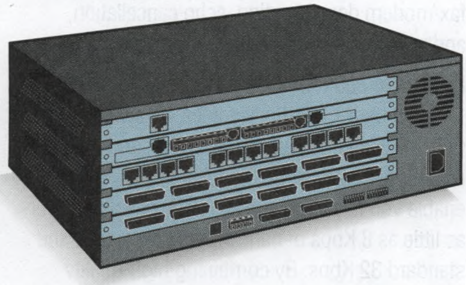


MS1 Network Management Module—Use this Module to troubleshoot your Multiserver, run tests, and generate statistical reports for easy maintenance (you can print the reports, too). Includes DB25 command and printer ports, and (1) 4-wire terminal block alarm relay.

CE Approval — Yes

Item	Code	Price
MS1 NMS Module	MX227C-R2	**$300.00**

Below, a sample back view of a Multiserver chassis with several optional modules installed. These modules are the heart of any Multiserver. They enable you to customize your system for virtually limitless configurations.

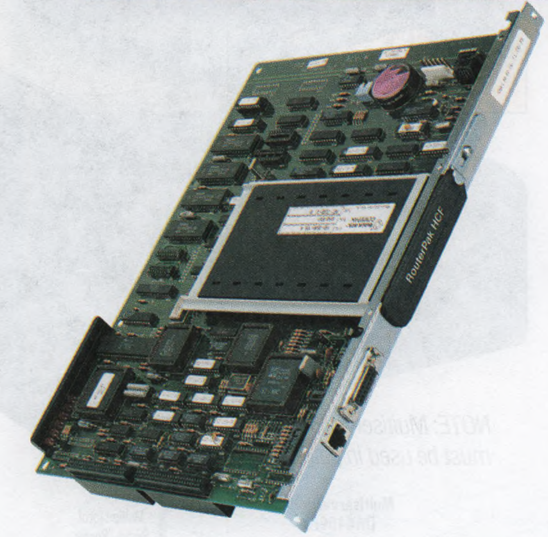


Item	Code	Price
MS1 Rackmount Kit	RM220	**$225.00**
remember to order **cables**		
Crossover Cable		
Male-to-Male	EZ423-0015	**$26.00**
Male-to-Female	EZ424-0015	**$26.00**
Straight-Thru Cable		
Female-to-Female	EZ425-0015	**$26.00**
DTE Adapter Kit		
Male	EZ419	**$20.00**
Female	EZ421	**$20.00**
DCE Modem Crossover Kit	EZ420	**$20.00**

In This Section...
Modems & Accessories
DDS CSU/DSUs
ISDN
T1/E1

Multiserver Series

Multiserver Integrated Router Module

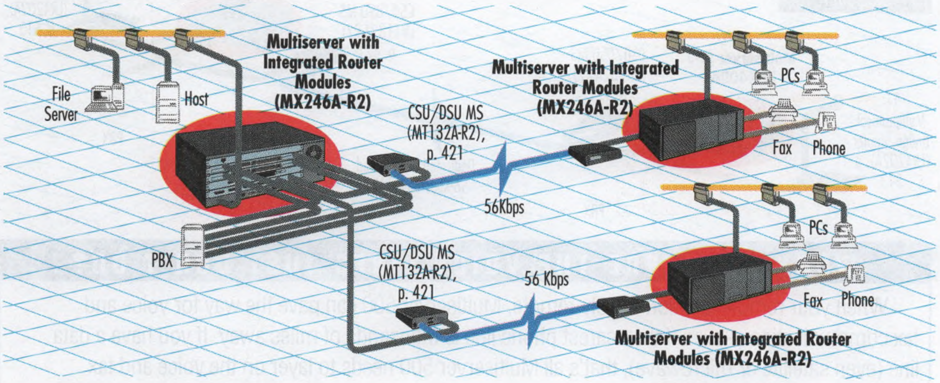


Add Full-Scale Ethernet TCP/IP and Novell IPX Remote Routing to Your Multiserver WAN.

- **Route TCP/IP and Novell IPX through your Multiserver network.**
- **Get full interoperability with any router.**
- **Automatic WAN routing of all protocols, even "nonroutable" DEC™ LAT and NetBIOS.**
- **ARP and SAP/RIP spoofing.**
- **Self-learning operation for easy network administration.**

This Multiserver Module from Black Box provides high-performance routing to your Multiserver WAN. The Router Module plugs into any of the Multiservers and then directly into your corporate Ethernet LAN. Client-server traffic can ride with data/voice/fax traffic without additional WAN links.

Unique EasyRouter™ technology reduces the time and costs associated with router network setup and maintenance. It adds full-scale Ethernet TCP/IP and Novell® IPX™ remote routing capabilities to your Multiserver-based WAN. And the Router Module learns the network itself so you don't have to keep updating.


Multiserver with Integrated Router Modules (MX246A-R2)
File Server
Host
PBX
CSU/DSU MS (MT132A-R2), p. 421
56Kbps
Multiserver with Integrated Router Modules (MX246A-R2)
PCs
Fax
Phone
CSU/DSU MS (MT132A-R2), p. 421
56 Kbps
PCs
Fax
Phone
Multiserver with Integrated Router Modules (MX246A-R2)

SPECIFICATIONS

Speed — Saturates up to (6) 56/64-Kbps links with 512 packets per second (64-byte packets)
Standards — IP per RFC 1009, IPX per IPX Router specification version 1.10 and RFC 1362
Connectors — DB15 AUI, RJ-45 10BASE-T
Power — From the Multiserver base unit

FAXBACK INFORMATION
Request Document Number: 12946
Call 412-746-5500 Anytime

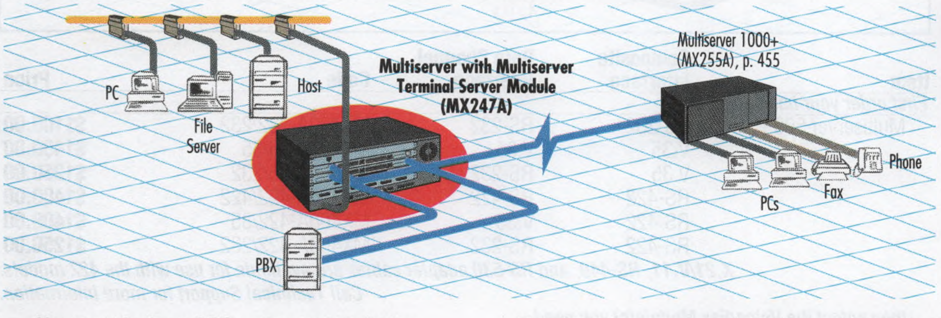
Item	Code	Price
Multiserver Integrated Router Module-Turbo	MX246A-R2	**$1950.00**
remember to order cables: Ethernet Transceiver Cable 10-ft. (3.0-m)	LCN200-0010	**$55.95**
For other lengths, see p. 78.		
Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		

◆ ◆ ◆

Multiserver Remote Terminal Server Module

Bring Terminal Server Functionality to Your Multiserver WAN.

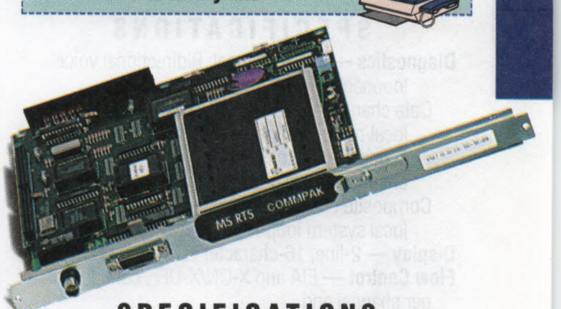
- **Your RS-232 devices can communicate over your TCP/IP- or UNIX® based WAN.**
- **Connect your PCs running SLIP to the Internet.**


PC
File Server
Host
PBX
Multiserver with Multiserver Terminal Server Module (MX247A)
Multiserver 1000+ (MX255A), p. 455
PCs
Fax
Phone

Now terminals and PCs can communicate with local or remote hosts on your Ethernet LANs. Simply slide the BLACK BOX® Terminal Server Module into your Multiserver Base Unit. With multiprotocol printing support, your PCs and terminals can print using NetWare®, AppleTalk®, LAT™, and Telnet™ RTEL/LPR protocols.

This Module works as a LAN gateway, opening Ethernet access to remote terminals anywhere on the Multiserver WAN. Also, on-site workstations can use the Module as a gateway so you don't need a terminal server.

FAXBACK INFORMATION
Request Document Number: 12946
Call 412-746-5500 Anytime


MS RTS COMMPAK

SPECIFICATIONS

Protocol — LAT, TCP/IP, Telnet, SLIP
CE Approval — Yes
Connectors — (1) 15-Pin AUI, (1) RJ-45 10BASE-T
Power — From the Multiserver base unit

Item	Code	Price
Multiserver Remote Terminal Server Module	MX247A	**$2750.00**
remember to order cables: Ethernet Transceiver Cable 10-ft. (3.0-m)	LCN200-0010	**$55.95**
For other lengths, see p. 78.		
Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		

Multiserver 500

Want Toll-Free Calling? Multiserver 500 Gives You Just That!

- **Get *absolutely free* point-to-point phone and fax calls with an existing data link.**
- **Excellent for point-to-point LAN links.**
- **Ideal solution when voice lines are hard to run or unreliable (see Diagram B).**

BLACK BOX
MULTISERVER 500
PO IS TD RD LS RS VA TM

Make free phone and fax calls when you use a pair of Multiserver 500s to send analog voice and fax transmissions via an existing dialup or leased data line.

Whether you manage a mainframe link or you're a telecommuter working from your home office, the result is the same—no extra charge for voice or fax calls between two sites.

Here's how it works: Multiserver 500 piggybacks phone and fax traffic onto your data line, whether you have a 56-Kbps sync digital leased line or an async dialup modem line.

Since your voice and fax don't go through the public telephone network anymore, you don't pay the telephone company's toll charges.

The added voice traffic is virtually transparent to the data line, so your data continues to go through as always. How?

First, the Multiserver compresses voice and fax calls by up to 95%. Standard 64-Kbps voice data shrinks to only 4 to 16 Kbps. Group III fax data is compressed to just 3 to 10 Kbps.

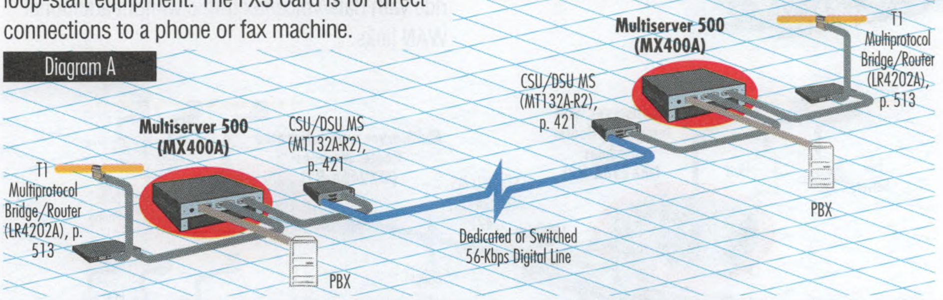
Second, the Multiserver manages bandwidth intelligently. Since voice and fax calls travel in short bursts, they're not on the link very often. In other words, your data line mostly sends data!

Choose from three base models for RS-232, RS-422, or V.35 equipment. Each features a Command Port on back for configuration through an async terminal.

Then select an appropriate Voice/Fax Card with the proper connection to your on-premises voice/fax equipment. The E&M Card is for connections to trunkside PBXs. The FXO Card is for the station side of a PBX or central-office loop-start equipment. The FXS Card is for direct connections to a phone or fax machine.

NOTE: Multiserver 500 must be used in pairs.

Diagram A

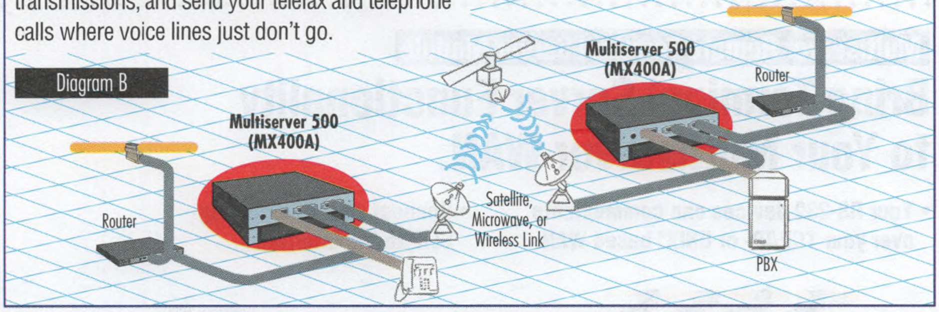


Multiserver 500 (MX400A)
T1 Multiprotocol Bridge/Router (LR4202A), p. 513
CSU/DSU MS (MT132A-R2), p. 421
PBX
Dedicated or Switched 56-Kbps Digital Line
CSU/DSU MS (MT132A-R2), p. 421
Multiserver 500 (MX400A)
T1 Multiprotocol Bridge/Router (LR4202A), p. 513
PBX

WORKING WHERE THE VOICE LINES JUST DON'T GO?

When your remote location is truly remote, Multiserver 500 can pave the way for voice and fax communication—even if the nearest phone line is thousands of miles away. If you have a data line (even satellite or microwave), that's all Multiserver 500 needs to layer on the voice and fax transmissions, and send your telefax and telephone calls where voice lines just don't go.

Diagram B



SPECIFICATIONS

Diagnostics — Voice channel: Bidirectional voice loopback;
Data channel: Local/remote loopback, local/remote output test with user-input echoed or fax message generated, local async channel loopback with user input echoed;
Composite channel: Remote composite loopback, local system loopback with user input echoed

Display — 2-line, 16-character LCD

Flow Control — EIA and X-ON/X-OFF, configurable per channel end

Protocol — Async; Sync: All major protocols, including BSC and DLC types

Speed — Voice channel: 4 to 16 Kbps;
Data channel: Sync up to 64 Kbps, async up to 57.6 Kbps;
Composite channel: Sync up to 72 Kbps

User Channels — (1) Data, (1) Voice/fax

CE Approval — All items listed are approved

Interface — Channel and composite: RS-232 or V.35

Connectors — MX400A: (2) DB25, (2) RJ-11 ports;
MX401C: (1) 8-screw terminal block;
MX403C, MX406C: (1) RJ-11 female, (1) 4-screw terminal block

Power — 94–265 VAC, 63–47 Hz, 30 watts

Size — 3"H x 8.5"W x 11.3"D (7.6 x 21.6 x 28.7 cm)

Item	**Composite Interface**	**Data Channel Interface**	**Code**	**Price**
First order your base unit…				
Multiserver 500	RS-232	RS-232	MX400A-232/232	**$1100.00**
	V.35	V.35	MX400A-35/35	**$1400.00**
	V.35	RS-232	MX400A-35/232	**$1250.00**
	RS-422	RS-422	MX400A-422/422	**$1400.00**
	RS-422	V.35	MX400A-422/35	**$1400.00**
	RS-422	RS-232	MX400A-422/232	**$1250.00**
…then select the Voice/Fax Module(s) you need…				
MS500 Standard Cards	E&M		MX402A	**$450.00**
	FXO		MX404A	**$450.00**
	FXS		MX407A	**$450.00**
DB25 Crossover Cable (Composite to DCE)				
	M-M		EZ423-0015	**$26.00**
	M-F		EZ424-0015	**$26.00**
RS-232 Cable, 10-ft. (3.0-m)			ECM25C-0010	**$23.95**

X.21/V.11, RS-449, and RS-530 adapter cables are available for use with the 422 models. Call Technical Support for more information.

remember to order cables

For other lengths, see p. 83. Specify gender when ordering.

BLACK BOX
5250 CFE MUX

BLACK BOX® Local Muxes—

We Have What You Need No Matter What Your Neighborhood—Fiberoptic, Twisted-Pair, or Mainframe Environments!

Local muxes enable you to connect multiple devices over a single cabling medium in a campus environment. And Black Box has all the local muxes you'll ever nneed regardless of your neighborhood—fiber, twisted-pair, or mainframe environments!

Our fiberoptic local muxes (**pages 462–463**) have an incredible range of features, from multiplexing up to 48 channels to delivering channel speeds up to 142 Kbps to muxing RS-232 data and running it over fiber! Plus these local muxes give you all the security of fiber optics, such as immunity to both EMI/RFI and lightning strikes.

Our local muxes for twisted-pair cabling (**pages 464–465**) are just as versatile. Multiplex up to 12 channels, use them for sync or async applications—or send data up to 3.2 miles (5 km) away. Save on cabling costs, too, since these muxes work on UTP wiring already in place.

For mainframe environments, Black Box has the local muxes to emulate various IBM® protocols—5250, 3299, 3274, 3174 (**page 466**). You'll be amazed at what you can run on coax cable these days!

Hungry for Line Savings? Black Box Has the Best Menu of Local Muxes!

It's true—Black Box has the best *and* the widest selection of local muxes, no matter your application, no matter your cabling. Here's just a small taste to whet your appetite for line savings.

Configure individual channel speeds separately with the Async/Sync Fiber Optic Mux (**page 463**). It multiplexes up to 12 channels of async or sync over fiber.

Multiplex eight *independent* full-duplex async channels of RS-232 data with the Local TDM-8 (**page 465**). It uses ordinary RJ-11 cabling, so you save even more!

Black Box even dishes up local muxes for old-time-favorite mainframe environments (**page 466**).

Connect up to eight AS/400® or S/3X ports to a duplex fiber, coax, or twisted-pair line with our 5250 Muxes.

Now that you've had a sampling of our menu, use the Buyer's Guide **below** to choose what satisfies your hunger for line savings. If you need help, just call Tech Support at **412-746-5500**. Otherwise, dig in!

BUYER'S GUIDE

LOCAL MUXES

Item	Page	Code	Price	Line Type				Interface			Max. User Channels	Channel Connectors	Channel Max. Speed	Max. Distance
				Fiber	UTP	Twinax	Coax	RS-232	Twinax	Coax				
Local Fiber Mux	**462**	MX895A	**$775.00**	✓	✓			✓			12	DB25	38.4 Kbps	3.2 mi. (5.1 km)
Async Fiber Optic Mux-24	**462**	MX512A	**$895.00**	✓				✓			24	DB25	142 Kbps	1.9 mi. (3.0 km)
Async/Sync Fiber Optic Mux	**463**	MX880A	**$915.00**	✓				✓			12	DB25	38.4 Kbps	3.2 mi. (5.1 km)
48-Channel Async Fiber Optic Mux	**463**	MX882A	**$1400.00**	✓				✓			48	50-Pin Telco	38.4 Kbps	2.5 mi. (4.0 km)
RS-232 to Fiber Optic Multiplexor	**463**	MX035A	**$1430.00**	✓				✓			8	DB25	19.2 Kbps	5.2 mi. (8.3 km)
	463	MX036A	**$2455.00**	✓				✓			16			
Async/Sync Local Mux	**464**	MX881A	**$720.00**		✓			✓			12	DB25	38.4 Kbps	1.0 mi. (1.6 km)
Local Mux-6	**464**	MX515A	**$550.00**		✓			✓			12	DB25	19.2 Kbps	1.0 mi. (1.6 km)
Miniature Local Mux	**464**	MX867A	**$255.00**		✓			✓			2	DB25	19.2 Kbps	2.5 mi. (4.0 km)
Local TDM-8	**465**	MX511A	**$405.00**		✓			✓			8	RJ-11	9.6 Kbps	5.1 mi. (8.2 km)
Local Async Mux (LD470)	**465**	ME724A	**$625.00**		✓			✓			4	DB25	19.2 Kbps	1.0 mi. (1.6 km)
	465	ME724A-LR	**$675.00**		✓			✓			4	DB25	9.6 Kbps	3.2 mi. (5.1 km)
	465	ME728A	**$855.00**		✓			✓			8	DB25	19.2 Kbps	1.0 mi. (1.6 km)
	465	ME728A-LR	**$925.00**		✓			✓			8	DB25	9.6 Kbps	3.2 mi. (5.1 km)
5250 Muxes	**466**	MX336A-R2	**$1295.00**	✓		✓	✓		✓		8	Twinax	1 Mbps	1.9 mi. (3.0 km)
	466	MX338A-R2	**$1095.00**	✓		✓	✓		✓		4	Twinax	1 Mbps	1.9 mi. (3.0 km)
3299I Mux	**466**	MX300A	**$575.00**				✓			✓	8	Coax BNC	2.25 Mbps	1.8 mi. (2.8 km)
2-Channel Coax Splitters	**466**	IC088A	**$89.00**				✓			✓	2	Coax BNC	2.25 Mbps	0.8 mi. (1.2 km)
	466	IC089A	**$99.00**				✓			✓	2	Coax BNC	2.25 Mbps	0.8 mi. (1.2 km)
Coax Mini-Mux 3	**466**	MX016A	**$110.00**				✓			✓	2	Coax BNC	2.25 Mbps	0.8 mi. (1.2 km)

Local Fiber Mux-6

Send Data over 6 Channels with Control Signals *or* over 12 Data Channels without Them.

BLACK BOX
Local Fiber Mux-6
POWER
TEST
SYNC LOSS
LOCAL
REMOTE

- **Send 6 channels of data, each with control signal, over one line.**
- **Multiplex 12 async subchannels over one line.**
- **Offers two main channel cable options: fiberoptic or twisted pair.**
- **Send data up to 3 miles over fiber.**
- **Set up point-to-point or ring configurations.**

Our new Local Fiber Mux-6 is so flexible, it's like getting two muxes in one. It offers you the option of using 6 or 12 channels, and fiber or twisted pair. And it includes a built-in modem for extra convenience.

Consolidate data from 12 async channels through the Mux onto a single line. Or, if needed, multiplex six data lines with one control signal each. The Mux contains 12 RS-232 interfaces via six DB25 connectors. Just use the Doubler Cable to expand the 6 channels into 12.

You also get line flexibility. You can use a dual fiberoptic line as your main channel for distances up to 3 miles (5.1 km). Or consolidate data over two twisted pairs for transmissions up to 1 mile (1.6 km).

The Mux offers local and remote digital loopback capability for diagnostic testing. And it comes with optional mounting hardware for a 19" rack.

SPECIFICATIONS

Maximum Distance — 3.2 miles (5.1 km) over fiberoptic, 1 mile (1.6 km) over twisted pair
Multiplexing Technique — Time-division
Operation — Full-duplex
Protocol — Async
Speed — Channel: Up to 38.4 Kbps; Composite: Up to 2.46 Mbps
User Channels — (6) or (12) with Doubler Cable
CE Approval — Yes
Interface — Channel: RS-232 (2 channels per port with Doubler Cable); Composite: Fiber ST®
Connectors — Multiplexor: (6) DB25 F (2 channels per port with Doubler Cable), (12) RJ-45; Line: (1) terminal block, (1) RJ-45; Composite: Fiber ST 850 nanometers
Indicators — (4) LEDs: Power, Test, Local Sync Loss, Remote Sync Loss
Power — 115 VAC, 60 Hz
Size — 1.8"H x 13.3"W x 8.6"D (4.6 x 33.8 x 21.8 cm)

NOTE: Must be used in pairs.

Item	Code	Price
Local Fiber Mux-6	MX895A	**$775.00**
Doubler Cable	EYN356	**$26.95**
Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

remember to order cables

For specific lengths or bulk cable, see pp. 74 and 118.

* * *

Async Fiber Optic Mux-24

Send 24 Channels of Data over One Duplex Fiber Line—Quickly, Easily, Safely.

BLACK BOX
FIBER OPTIC ASYNC MULTIPLEXOR
LB
PWR
SYNC LOSS
CHANNEL / GROUP ACTIVITY
0
1
2
3
4
5
6
7

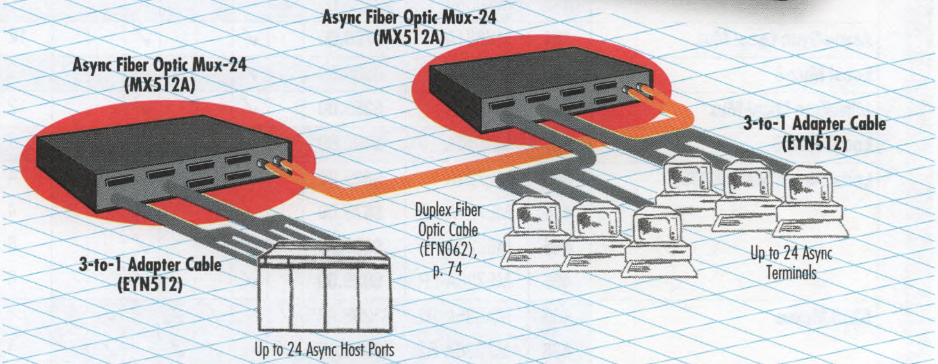
- **Multiplexes data from 24 async devices over *one* duplex fiber cable.**
- **Supports 115.2-Kbps applications.**
- **Offers the safety, security, and high speed of fiber.**

Merge data from up to 24 async RS-232 devices onto one duplex fiber cable with the Async Fiber Optic Mux-24. This Mux has eight RS-232 ports. With a 3-to-1 Adapter Cable, you can attach three devices to each Mux port for a total of 24.

The Mux supports 115.2-Kbps applications. In fact, each channel supports speeds of up to 142 Kbps! The fiberoptic part of the circuit is completely transparent, so each RS-232 channel operates independently in full-duplex.

The fiber link gives you the flexibility to simplify your network's cabling and reduce cabling costs.

NOTE: Must be used in pairs.


Async Fiber Optic Mux-24 (MX512A)
Async Fiber Optic Mux-24 (MX512A)
3-to-1 Adapter Cable (EYN512)
Duplex Fiber Optic Cable (EFN062), p. 74
3-to-1 Adapter Cable (EYN512)
Up to 24 Async Terminals
Up to 24 Async Host Ports

SPECIFICATIONS

Distance — 1.9 miles (3 km)
Speed — Up to 142 Kbps per channel; Composite: 40 Mbps
CE Approval — All items listed are approved
Connectors — RS-232: (8) DB25 female; Fiberoptic: (2) ST or (2) SMA
Power — 115 VAC, 60 Hz, 60 watts
Size — 2.5"H x 12"W x 11.3"D (6.4 x 30.5 x 28.7 cm)
Weight — 9.4 lb. (4.3 kg)

Item	Code	Price
Async Fiber Optic Mux-24		
ST	MX512A-ST	**$895.00**
SMA	MX512A-SM	**$895.00**
3-to-1 Adapter Cable	EYN512	**$53.85**

remember to order cables

Async/Sync Fiber Optic Mux

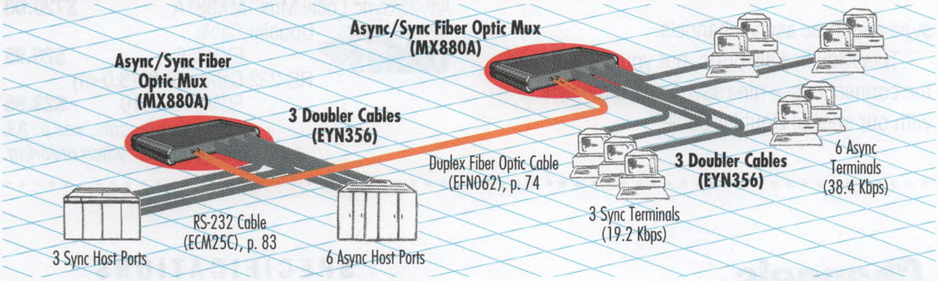
Async and Sync Data, up to 12 Channels—over Fiber.

- **Multiplexes async and sync data.**
- **Built-in short-haul modem drives your data.**
- **Configure each channel's speed separately.**
- **6 channels—upgrade to 12 with doubler cables.**

BLACK BOX® (412) 746-5500
POWER
TEST
SYNC LOSS LOCAL REMOTE
LLB
RLB
FIBER OPTIC ASYNC/SYNC LOCAL MUX

Multiplex a mix of async and sync devices. Async users get as many as 12 channels with our special Doubler Cable (the unit comes with 6 channels). If you have both async and sync devices, you can run 6 async and 3 sync channels.

A built-in short-haul modem drives the high-speed multiplexed data up to 3.2 miles (5.1 km).


Async/Sync Fiber Optic Mux (MX880A)
Async/Sync Fiber Optic Mux (MX880A)
3 Doubler Cables (EYN356)
Duplex Fiber Optic Cable (EFN062), p. 74
3 Doubler Cables (EYN356)
6 Async Terminals (38.4 Kbps)
3 Sync Terminals (19.2 Kbps)
RS-232 Cable (ECM25C), p. 83
3 Sync Host Ports
6 Async Host Ports

SPECIFICATIONS

Distance — 3.2 mi. (5.1 km)
Speed — Channel: Async up to 38.4 Kbps, Sync up to 19.2 Kbps;
Composite: 2.46 Mbps
CE Approval — 230-VAC versions: MX880AE, MX880AE-ST
Interface — Channel: RS-232, DCE;
Composite: Dual fiberoptic
Connectors — Channel: (6) DB25 female;
Composite: (2) SMA or ST®;
Doubler Cable: (1) DB25 male to (2) DB25 female
Power — 115 VAC, 60 Hz or 230 VAC, 50 Hz
Size — 1.8"H x 13.3"W x 7.9"D (4.6 x 33.8 x 20.1 cm)
Weight — 3.5 lb. (1.6 kg)

Item	Code	Price
Async/Sync Fiber Optic Mux		
SMA	MX880A	**$915.00**
ST	MX880A-ST	**$915.00**
remember to order cables Doubler Cable	EYN356	**$26.95**
Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific lengths or bulk cable, see pp. 74 and 118.

◆ ◆ ◆

48-Channel Async Fiber Optic Mux

Run 48 Async Terminals over a Single Fiberoptic Cable.

- **Up to 48 terminals over fiber cable.**
- **Monitor from either end of the system.**
- **Built-in modem pushes data up to 2.5 miles (4 km).**

Design the network you want—either point to point or ring. The Async 48-FOM multiplexes up to 48 async terminals onto one channel. A built-in modem propels data up to 2.5 miles (4 km).

With local and remote loopback, monitoring is easy from either end of the system. LEDs show remote and local sync loss, power, and tests. The Mux connects to async terminals via a telco 50-pin connector.

SPECIFICATIONS

Speed — Up to 38.4 Kbps
CE Approval — 230-VAC versions: MX882AE-ST, MX882AE-SMA
Interface — RS-232
Connectors — (4) 50-pin telco female, (2) fiberoptic SMA or ST
Indicators — (4) LEDs: Remote Sync Loss, Local Sync Loss, Power, Test
Power — 115 VAC, 60 Hz or 230 VAC, 50 Hz
Size — 1.7"H x 19"W x 8.5"D (4.3 x 48.3 x 21.6 cm)
Weight — 5.3 lb. (2.4 kg)

Item	Code	Price
Async 48-Fiber Optic Mux		
ST	MX882A-ST	**$1400.00**
SMA	MX882A-SMA	**$1400.00**
remember to order cables ***If your punchblock has a female connector, order:*** Telco-Type Connector Cable	ELN25T-0005-MM	**$19.95**

For other lengths and genders, see p. 71.

◆ ◆ ◆

RS-232 to Fiber Optic Multiplexor

Multiplex 8 or 16 Channels of RS-232 Data and Run It on One Fiberoptic Pair.

- **Sync or async operation.**
- **Triple the capacity—up to 48 channels—with 3-to-1 Adapter Cables.**

Consolidate your sync or async channels over one fiberoptic line with the BLACK BOX® RS-232 to Fiber Optic Multiplexor. Your network can get all the benefits of fiber systems: super-clear transmission, electrical isolation, and surge protection. And you get the flexible operation you need with easy installation and a choice of sync or async channels.

You can easily configure any of the ports on these 8- or 16-Channel Muxes for sync or async operation to match the needs of your application. And with our 3-to-1 Adapter Cable, you can triple async multiplexing capacity. On one dual fiberoptic line, you get 24 channels instead of 8 or 48 channels instead of 16.

Each sync and async subchannel speed is user-selectable up to 19.2 Kbps, and you can get a composite data rate of up to 11 Mbps.

NOTE: Must be used in pairs.

SPECIFICATIONS

Distance — 7200 ft. (2195 m)
Speed — Channel: Async: Transparent up to 19.2 Kbps;
Sync: Up to 19.2 Kbps;
Composite: 11 Mbps
CE Approval — 230-VAC versions: MX035AE-ST, MX035AE, MX036AE-ST, MX036AE
Connectors — Channel: (8) or (16) DB25 female;
Composite: (2) SMA 905 or (2) ST; 3-to-1;
Adapter Cable: (1) DB25 male to (3) DB25 female
Power — 115 VAC, 60 Hz, 60 watts
Size — 3.4"H x 16.6"W x 12.2"D (8.6 x 42.2 x 31 cm)
Weight — 8.4 lb. (3.8 kg)

Item		Code	Price
RS-232 to Fiber Optic Multiplexor			
8-Channel	ST	MX035A-ST	**$1430.00**
	SMA	MX035A	**$1430.00**
16-Channel	ST	MX036A-ST	**$2455.00**
	SMA	MX036A	**$2455.00**
remember to order cables	3-to-1 Adapter Cable	EYN512	**$53.85**

Async/Sync Local Mux

Multiplex 12 Ports onto Two Twisted Pairs.

SPECIFICATIONS

Clock — Internal
Distance — 1 mi. (1.6 km) over 22 AWG cable
Multiplexor Type — Time-division
Protocol — Async or sync, transparent
Speed — Channel: Async, to 38.4 Kbps;
Sync, to 19.2 Kbps; Composite: 1.2 Mbps
Interface — Channel: RS-232, DCE;
Composite: (2) twisted pairs
Connectors — Channel: (6) DB25 female;
Composite: (1) 5-screw terminal block;
Doubler Cable: (1) DB25 male to (2) DB25 female
Power — 115 VAC, 60 Hz or 230 VAC, 50 Hz
Size — 1.8"H x 13.3"W x 7.9"D (4.6 x 33.8 x 20.1 cm)

- **Async and sync applications.**

For longer-distance point-to-point configurations, you need the BLACK BOX® Async/Sync Local Mux. You can run async and sync applications simultaneously. In Async Mode, you get six async channels. In Sync Mode, you get three sync and three async channels.

This Mux has six ports, but you can get twice the connections—nine async and three sync—with our special Doubler Cable.

Item	Code	Price
Async/Sync Local Mux	MX881A	$720.00
Doubler Cable	EYN356	$26.95
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	$23.95

remember to order cables

For other lengths, see p. 83.
Specify gender when ordering.

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Local Mux-6

Multiplex 6 or 12 Async Channels over 24 AWG up to 1 Mile Away.

SPECIFICATIONS

Clock — Internal
Distance — 1 mi. (1.6 km) over 24 AWG
Multiplexor Type — Time-division
Protocol — Async
Speed — Channel: Up to 19.2 Kbps;
Composite: Up to 1.2 Mbps
CE Approval — All items listed are approved
Interface — Channel: RS-232;
Composite: (2) twisted pairs
Connectors — Channel: (6) DB25 female;
Composite: (1) 5-screw terminal block;
Doubler Cable: (1) DB25 male to (2) DB25 female
Power — 115 VAC, 60 Hz or 230 VAC, 50 Hz
Size — 1.7"H x 13.3"W x 8.6"D (4.3 x 33.8 x 21.8 cm)
Weight — 3.5 lb. (1.6 kg)

- **Mux six async channels onto a single line. Or use Doubler Cable and put 12 channels on one line!**
- **Send data up to 1 mile (1.6 km) away.**

Need powerful muxing capacity for short-range jobs? The Local Mux-6 carries a load. This full-duplex Mux enables up to 12 async channels to be multiplexed onto a single channel!

Turn its six subchannels into 12 with a simple connection of Doubler Cable. Set the Mux's internal strap to select the number of channels and you're ready to go—send data up to 1 mile (1.6 km) away over 24 AWG.

Multiplexing is done using an oversampling technique. Each of the 12 channels is sampled at 157.2 Kbps.

Item	Code	Price
Local Mux-6	MX515A	$550.00
	MX515AE	$742.00
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	$23.95

remember to order cables

For other lengths, see p. 83.
Specify gender when ordering.

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Miniature Local Mux

Multiplex 2 Ports over Two Twisted Pairs.

- **Consolidates data remotely.**

The BLACK BOX® Miniature Local Mux is perfect for consolidating data from two async or sync terminals at a remote site. It's small—it fits in the palm of your hand!—but it's powerful. Its integral short-haul modem drives async data up to 9600 bps and sync data up to 19.2 Kbps. It's powered from the RS-232 interface so no power supply is necessary. Transformer isolation protects your data.

FAXBACK INFORMATION
Request Document Number: 11677
Call 412-746-5500 Anytime

SPECIFICATIONS

Maximum Distance — Async: 1.2 mi. (2 km) at 9600 bps over 24 AWG wire;
Sync: 2.5 mi. (4 km) at 19.2 Kbps over 24 AWG wire
Protocol — Async or Sync
Speed — Subchannel: Async: Up to 9600 bps;
Composite: 38.4 Kbps;
Sync: Up to 19.2 Kbps
CE Approval — Yes
Interface — RS-232C, DCE
Connectors — Subchannel: (2) DB25 female;
Composite: 4-screw terminal block
Power — From RS-232 data and control signals (Pins 4 and 20)
Size — 1.2"H x 2.2"W x 5.4"D (3 x 5.5 x 13.8 cm)
Weight — 0.4 lb. (0.2 kg)

5.4"
2.2"
MLM
SUB 1
SUB 2

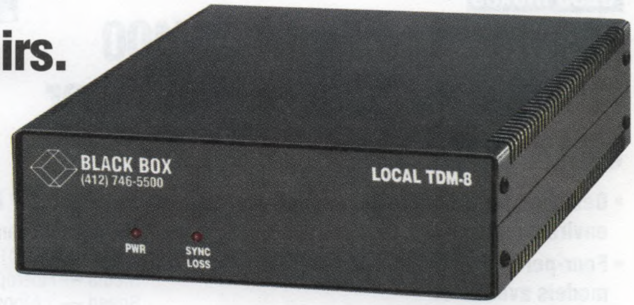
Item	Code	Price
Miniature Local Mux	MX867A	$255.00
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	$23.95

remember to order cables

For other lengths, see p. 83.
Specify gender when ordering.

Local TDM-8

Multiplex 8 Ports over Two Twisted Pairs.



- **Uses existing RJ-11 wiring— so you save BIG on cabling expenses!**
- **Built-in surge protection.**
- **Fast sampling rate on each port.**
- **Signal distortion is cut.**
- **Adapter Kits convert DB25 connections to RJ-11.**

Black Box has the Time-Division Mux for your twisted-pair application!

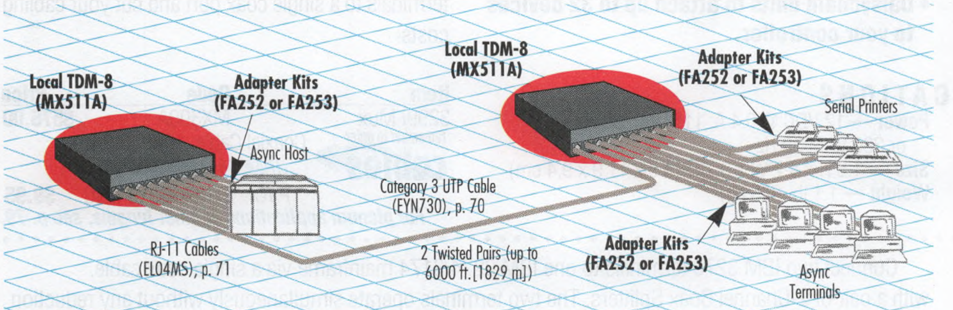
With a pair of Local TDM-8 Muxes, you can multiplex up to eight independent full-duplex async channels of RS-232 data. That's perfect for sharing limited cable by dumb terminals and PCs!

And using existing RJ-11 wiring saves you money on wiring costs, too. Use one RJ-11 Adapter Kit for each conversion of a DB25 connection to RJ-11.

Your data is safe, too, with the Local TDM-8. Isolation transformers are built in so you get surge protection!

And the benefits keep coming—this Mux has a fast sampling rate on each port, so you don't miss any important data bits. Signal distortion is eliminated, too. Line-equalization jumpers cut signal distortion caused by line-impedance mismatches. Even if your communications line has several lengths of wire with different gauges, the jumpers ensure that your Local TDM-8s are synchronized.

FAXBACK INFORMATION
Request Document Number: 10896
Call 412-746-5500 Anytime


Local TDM-8 (MX511A)
Adapter Kits (FA252 or FA253)
Async Host
RJ-11 Cables (EL04MS), p. 71
Category 3 UTP Cable (EYN730), p. 70
2 Twisted Pairs (up to 6000 ft. [1829 m])
Local TDM-8 (MX511A)
Adapter Kits (FA252 or FA253)
Serial Printers
Adapter Kits (FA252 or FA253)
Async Terminals

SPECIFICATIONS

Flow Control — Software only
Maximum Distance — 6000 ft. (1828.8 m)
Multiplexor Type — Time-division
Protocol — Asynchronous, transparent
Speed — Subchannel: To 9600 bps; Composite: 671 Kbps
CE Approval — Yes
Interface — Subchannel: RS-232; Composite: 4-wire differential
Connectors — (9) RJ-11 female
Power — 115 VAC, 60 Hz or 230 VAC, 60 Hz from wallmount power supply
Size — 1.5"H x 6.5"W x 8.5"D (3.8 x 16.5 x 21.6 cm)
Weight — 3.3 lb. (1.5 kg)

Item	Code	Price
Local TDM-8	MX511A	**$405.00**
RJ-11 Adapter Kit		
Male	FA252	**$10.20**
Female	FA253	**$10.20**

remember to order **cables**

RJ-11 (4-Wire) Modular Cable, 7-ft. (2.1-m), Straight-Pinned	EL04MS-07	**$2.95**

For other lengths and pinnings, see p. 71.

Category 3 Solid Conductor Cable, PVC Straight Pinning	EYN730MS-MM	**$6.95 + $.11/ft.**

For plenum applications or other pinnings, see p. 70.

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Local Async Mux (LD470)

4-Wire Line Drivers Multiplex up to 8 Channels.

- **Built-in line drivers boost distance.**
- **Support for hardware handshaking.**

The LD470 Series Multiplexors give you flexibility. Choose 4- or 8-Port versions and choose the distance you need—all LD470 Muxes come with built-in line drivers. Base models send async data up to 5000 feet (1520 m). But the -LR models go over three times as far (3.2 miles or 5 km)!

The LD470 Muxes support hardware handshaking. They pass data and one control lead required for flow control between your async host and up to eight terminals or printers.

BLACK BOX®
LD-474

SPECIFICATIONS

Speed — Channel: ME724A, ME728A: Up to 19.2 Kbps; ME724A-LR, ME728A-LR: Up to 9600 bps; Composite: ME724A, ME728A: 819.6 Kbps; ME724A-LR, ME728A-LR: 296.9 Kbps
CE Approval — ME728A, ME728A-LR; 230-VAC versions: ME724AE, ME724AE-LR, ME728AE, ME728AE-LR
Interface — Channel: RS-232; Composite: 4-wire, differential
Connectors — Channel: (4) or (8) DB25 female; Composite: (1) 5-screw terminal block
Power — 115/230 VAC, 60/50 Hz, 15 watts (switch-selectable)
Size — 2.8"H x 12"W x 11"D (7.1 x 30.5 x 27.9 cm)

FAXBACK INFORMATION
Request Document Number: 10126
Call 412-746-5500 Anytime

Item		Code	Price
Asynchronous Line Driver Multiplexor (LD470 Series)			
LD474	4-Port	ME724A	**$625.00**
LD474LR	4-Port Long-Range	ME724A-LR	**$675.00**
LD478	8-Port	ME728A	**$855.00**
LD478LR	8-Port Long-Range	ME728A-LR	**$925.00**

remember to order **cables**

RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.
Specify gender when ordering.

5250 Muxes

Merge up to Eight AS/400 or S/3X Ports over One Fiber or Copper Line.

- **Designed for IBM AS/400 and S/3X environments.**
- **Four-port (CF4) and eight-port (CF8) models available.**
- **Use duplex fiber, UTP, IBM cabling or coax.**

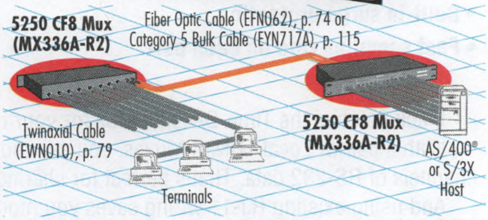
Connect four or eight AS/400® or S/3X ports to a duplex fiber, coax, or twisted-pair trunk line.

The CF8 connects up to 28 devices over fiber or copper. And with the CF8, you can connect up to 56 devices to eight IBM® AS/400 or S/3X ports through a single trunk line. These Muxes are fully compatible with the 5250 protocol.

SPECIFICATIONS

Maximum Distance — 0.9 mi. (1.5 km) over copper; 1.9 mi. (3 km) over fiber
Media — Fiberoptic and coax
Speed — 1 Mbps
User Channels — MX336A-R2: 8; MX338A-R2: 4
CE Approval — All items listed are approved
Connectors — MX336A-R2: (8) Twinaxial, (2) ST®, (1) DPC;
MX338A-R2: (4) Twinaxial, (2) ST, (1) DPC
Power — 115 VAC, 60 Hz or 230 VAC, 50 Hz
Size — 2.2"H x 19"W x 11"D (5.5 x 48.2 x 28 cm)
Weight — 6.9 lb. (3.1 kg)

NOTE: Must be used in pairs.



Item	Code	Price
5250 CF8 Mux	MX336A-R2	**$1295.00**
5250 CF4 Mux	MX338A-R2	**$1095.00**

remember to order **cables**

Twinaxial Cable, 10-ft. (30-m)
(IBM Part #7362062)
PVC EWN010-0010-MM **$44.95**
For other lengths, see p. 79.

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3299I Mux

Get More Distance and 3299 Emulation.

- **Get 10,000 feet (3048 m) between controller and terminals over coax.**
- **Daisychain units to attach up to 32 devices to your controller.**

For multipoint or point-to-point use, this eight-port Mux emulates the IBM 3299. Multiplex eight terminals to a single coax port and cut your cabling costs.

SPECIFICATIONS

Maximum Distance — 10,000 ft. (3048 m)
Media — Coax
Speed — 2.25 Mbps
User Channels — 8
Connectors — (9) BNC female
Power — 12 VDC @ 0.4 A; 115 VAC, 60 Hz or 230 VAC, 50 Hz
Size — 1.5"H x 4.7"W x 3.7"D (3.8 x 11.9 x 9.4 cm)
Weight — 1.1 lb. (0.5 kg)

Item	Code	Price
3299I Mux	MX300A	**$575.00**

remember to order **cables**

Coaxial Cable, 10-ft. (3.0-m)
(IBM® Part #2577672)
PVC ETN62-0010-BNC **$9.95**
For plenum applications or other lengths, see p. 79.

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2-Channel Coax Splitters

Link Two 3270 Terminals to One 3274/ 3174 with a Single Cable.

- **Just attach a Splitter to the controller end and another to the terminal end.**
- **Range up to 4000 feet (1200 m).**
- **No AC power required.**

Connect two IBM 3270 terminals to one IBM 3274/3174 mainframe via a single coax cable, with a pair of 2-Channel Coax Splitters. The two terminals operate simultaneously without any reduction in performance or increase in response time.

Coax Splitters are compact and lightweight, and they operate without AC power. Two versions are available. The IC088A comes with a female BNC connector for the main channel and one male BNC on each of the two subchannels. The IC089A comes with three female BNC connectors.

NOTE: Must be used in pairs.

CE Approval — All items listed are approved

BLACK BOX
COAX
SPLITTER

Item	Code	Price
2-Channel Coax Splitters		
(1) Female, (2) Male	IC088A	**$89.00**
(3) Female	IC089A	**$99.00**

remember to order **cables**

Coaxial Cable, 10-ft. (3.0-m)
(IBM® Part #2577672)
PVC ETN62-0010-BNC **$9.95**
For plenum applications or other lengths, see p. 79.

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Coax Mini-Mux 3

Save Cabling Costs with This Compact, Non-Powered Mux.

BLACK BOX®
Coax Mini Mux 3
J1
MAIN
J2

NOTE: Must be used in pairs.

- **Link a controller to two IBM terminals or printers up to 4200 feet (1280 m) away!**

Compact and non-powered, the BLACK BOX® Coax Mini-Mux 3 is perfect for small jobs. Run just one coax cable between a controller and two remote IBM terminals or printers. Use your existing line—you don't have to install a second one! If you haven't installed cable yet, you can put in one cable instead of two.

SPECIFICATIONS

Maximum Distance — 4200 ft. (1280 m)
Media — Coax
Speed — 2.25 Mbps
User Channels — 2
Connectors — BNC female (channel and composite)
Power — None
Size — 1"H x 2.1"W x 3.9"D (2.5 x 5.3 x 9.9 cm)
Weight — 0.4 lb. (0.2 kg)

Item	Code	Price
Coax Mini-Mux 3	MX016A	**$110.00**

remember to order **cables**

Coaxial Cable, 10-ft. (3.0-m)
(IBM® Part #2577672)
PVC ETN62-0010-BNC **$9.95**
For plenum applications or other lengths, see p. 79.

Modem Splitters

Share One High-Speed Modem Six Ways—and Count Your Cost Savings!

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!

BLACK BOX®
PORT 1
PORT 2
PORT 3
PORT 4
PORT 5
PORT 6
MASTER PORT
ABSOLUTELY GUARANTEED FOR LIFE

- **Modem sharing for three to six users.**
- **Perfect for offices or workgroups that do limited amounts of data communications or only connect to the Internet on occasion.**
- **Inexpensive, non-powered, easy to use.**
- **Use with sync *or* async devices.**

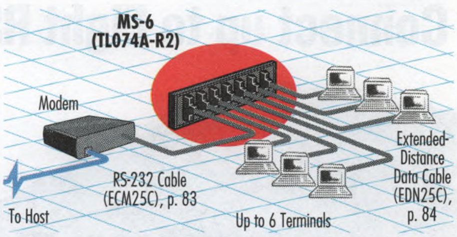
Our Modem Splitters give you basic modem sharing in a nonpowered, inexpensive, and easy-to-use device. Use them to connect multiple terminals to one modem and save a nice chunk of change—you won't need extra modems and extra lines!

Modem Splitters are ideal for offices or workgroups that do limited amounts of data transfer or occasionally connect to the Internet or online services.

No special cables are needed. Both use ordinary straight-pinned cables for hookup. Modem Splitters are transparent to speed and protocol and they work equally well in sync and async environments.

If you need port contention or advanced features such as prioritized port-scanning, see our RS-232 Line Sharer or our Programmable Sharing Device, both on **page 468**.

The Modem Splitter Ready Paks come with the Modem Splitter and all the RS-232 Cable (ECM25C) you need.



SPECIFICATIONS

Leads Supported — Pins 1–8, 15, 17, 20
Operation — Synchronous or asynchronous
Interface — RS-232 (master port DTE, slave ports DCE)
Connectors — MS-3: (4) DB25 female;
MS-6: (7) DB25 female

Item	Code	Price
Modem Splitter		
3-Port (MS-3)	TL073A-R2	$75.00
Modem Splitter-3 Ready Pak Includes: the Modem Splitter **plus** (**3**) M/F RS-232 Cables **and** (**1**) M/M RS-232 Cable	TL073A-R2-CABPAK	$146.80
6-Port (MS-6)	TL074A-R2	$139.00
Modem Splitter-6 Ready Pak includes: the Modem Splitter **plus** (**6**) M/F RS-232 Cables **and** (**1**) M/M RS-232 Cable	TL074A-R2-CABPAK	$306.65
Extended-Distance Data Cable 50-ft. (15.2-m)	EDN25C-0050	$56.95

remember to order cables

For other lengths, see p. 84.

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Non-Powered Port-Sharing Device (NPPS) • Non-Powered Modem-Sharing Device (NPMS)

Eliminate the Cost of Extra Modems and Communication Ports.

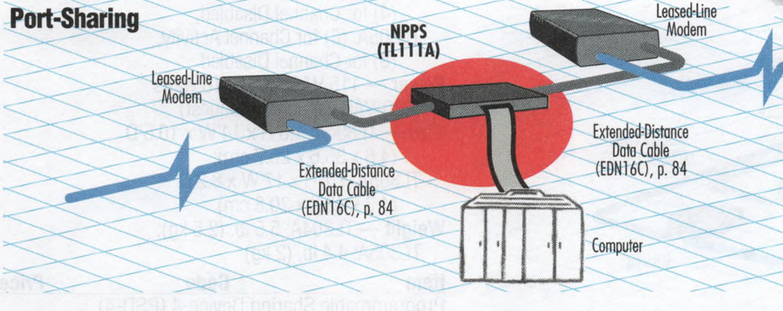
- **Cut equipment costs and save money.**
- **Active port contention.**
- **Powered from the RS-232 line.**
- **Transparent in sync or async environments.**

These data-line sharers are more than just splitters. They give you active port contention, draw power from the RS-232 line, are data-transparent in sync or async environments, and support speeds up to 19.2 Kbps.

With the Non-Powered Port-Sharing Device (NPPS), you can share one host port with two modems. There's no need to add an expensive port expansion with the NPPS.

The Non-Powered Modem-Sharing Device (NPMS) shares one modem over two terminals. There's nothing to set—just make the connection and start sharing!

Port-Sharing



SPECIFICATIONS

Contention Type — NPPS: Control (DCD) or data signals; NPMS: Control (RTS) signal
CE Approval — All items listed are approved
Interface — RS-232
Connectors — NPPS: (2) DB25 female (modem), (1) DB25 female (port);
NPMS: (1) DB25 male (modem), (2) DB25 female (port)

Item	Code	Price
Non-Powered Port-Sharing Device (NPPS)	TL111A	$255.00
Non-Powered Modem-Sharing Device (NPMS)	TL112A	$179.00
Extended-Distance Data Cables 50-ft. (15.2-m)	EDN16C-0050	$42.95

remember to order cables

For other lengths, see p. 84.

RS-232 Line Sharers

Connect up to Eight RS-232 Devices over One Line.

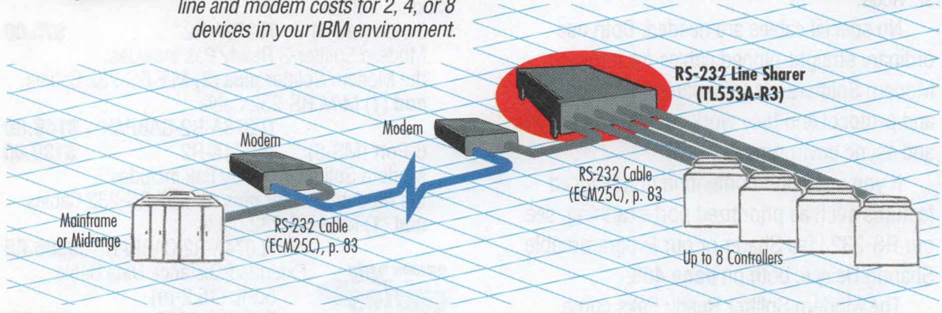
RS-232 LINE SHARER-2
RS-232 LINE SHARER-4
RS-232 LINE SHARER-8
BLACK BOX

An RS-232 Line Sharer cuts line and modem costs for 2, 4, or 8 devices in your IBM environment.

- **Get transparent speeds up to 64 Kbps.**
- **Run sync or async, half- or full-duplex.**

These Line Sharers feature antistreaming circuitry that locks out any port the instant it begins to stream. On the 4- and 8-Port models, hardware-prioritized scanning lets the most frequently used channels go first.

FAXBACK INFORMATION
Request Document Number: 10920
Call 412-746-5500 Anytime


RS-232 Line Sharer (TL553A-R3)
Modem
Modem
RS-232 Cable (ECM25C), p. 83
Mainframe or Midrange
RS-232 Cable (ECM25C), p. 83
Up to 8 Controllers

SPECIFICATIONS

Clock — External (from DCE)
Contention Type — RTS/CTS
Leads Supported — 1–10, 15, 17, 20, 22
CE Approval — TL553A-R3;
230-VAC versions: TL554AE-R3, TL601AE-R2
Interface — RS-232 (master port DTE, slave ports DCE)
Connectors — (3), (5), or (9) DB25 female
Indicators — 2-Port: (6): PWR, RTS A, RTS B, CD, CTS, RXD;
4-Port: (8): PWR, RTS A through RTS D, CD, CTS, RXD;
8-Port: (12): PWR, RTS A through RTS H, CD, CTS, RXD
Power — 115 VAC, 60 Hz (230-VAC version on request)

Item	Code	Price
RS-232 Line Sharers		
2-Port (in Metal Case)	TL601A-R2	**$280.00**
4-Port	TL553A-R3	**$515.00**
8-Port	TL554A-R3	**$715.00**
remember to order cables Adapter Cable (for IBM 3174/3274 Controller)	EHM002	**$21.55**
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.
Specify gender when ordering.

• • • • • • • • • • • • • • • • • • • •

Programmable Sharing Device (PSD-4)

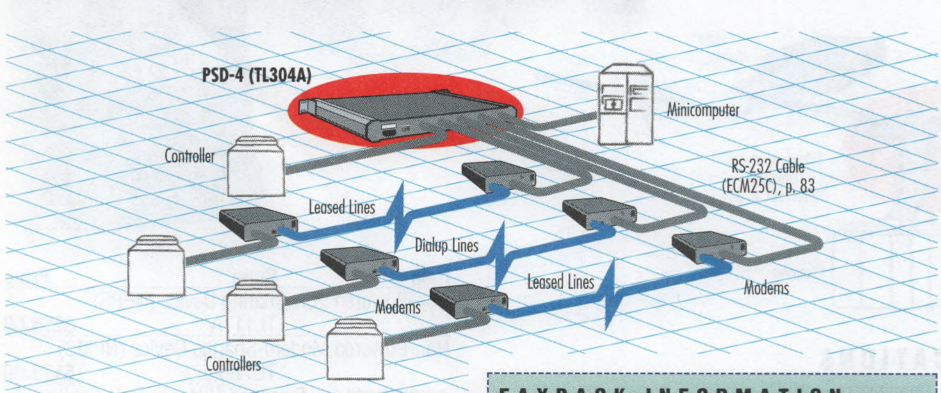
Merge Multiple DTEs onto a Single Host Port.

BLACK BOX
POWER
DATA
ACTIVITY
SUB CHANNEL DISABLE
AUTOMATIC
PSD-4

- **4- or 8-Port models available. Choose the best fit for your application, or get extra ports now so you have room to grow.**
- **Switch-selectable DCE/DTE. Connect terminals or modems without crossover cables.**

The BLACK BOX® PSD-4 enables multiple sync terminals or modems to access an IBM® host via a single host port connection. It provides the local clocking you need for on-site setups, or external clocking for remote applications. You can configure the PSD-4 to disable "active" ports that haven't sent data for a predefined length of time. Or disable ports manually with the front-panel switches.

Flexible contention methods make the PSD-4 easy to use when the usual signals aren't available. Choose RTS, DCD, or actual data signals to control contention.


PSD-4 (TL304A)
Minicomputer
Controller
RS-232 Cable (ECM25C), p. 83
Leased Lines
Dialup Lines
Leased Lines
Modems
Modems
Controllers

FAXBACK INFORMATION
Request Document Number: 12269
Call 412-746-5500 Anytime

SPECIFICATIONS

Clock — Internal (self-generated) or external (from DTE or DCE)
Contention Type — Control (RTS or DCD) or data signals
Operation — Synchronous or asynchronous
Speed — Up to 19.2 Kbps
CE Approval — All items listed are approved
Interface — RS-232
Connectors — (5) DB25 female
Indicators — Both: (1) ON/OFF, (1) for data broadcast from main channel to subchannels;
TL304A: (4) for Channel Activity, (4) for Channel Disabled;
TL305A: (8) for Channel Activity, (8) for Channel Disabled
Power — 115 VAC, 60 Hz, 10 watts (230-VAC version on request)
Size — TL304A: 1.8"H x 14"W x 10.5"D (4.6 x 35.6 x 26.7 cm);
TL305A: 1.7"H x 17"W x 8.2"D (4.3 x 43.2 x 20.8 cm)
Weight — TL304A: 5.5 lb. (2.5 kg);
TL305A: 4.4 lb. (2 kg)

Item	Code	Price
Programmable Sharing Device-4 (PSD-4)		
4-Port	TL304A	**$699.00**
8-Port	TL305A	**$1000.00**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.
Specify gender when ordering.

V.35 Line Sharers

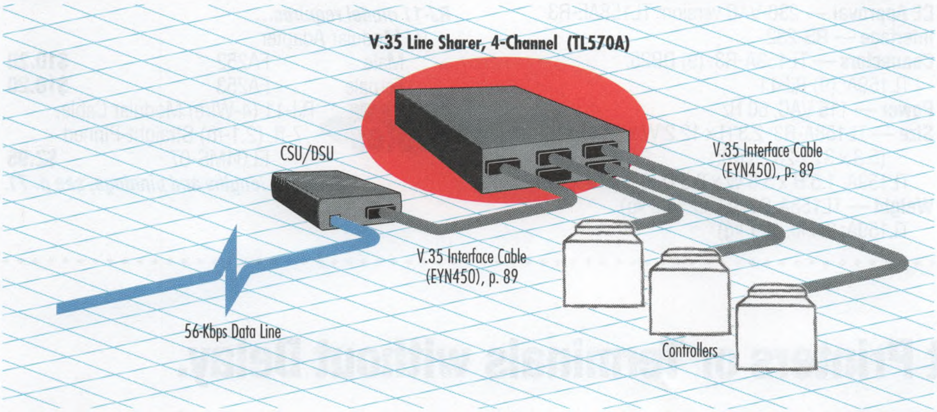
Here's a Great Way to Save with High-Speed V.35 Links—Link up to Four Circuits over Just One CSU/DSU.

- **Run two or four remote controllers from one host at V.35 speeds.**

If you need multiple controllers at one site, then you need a BLACK BOX® V.35 Line Sharer. These versatile bidirectional Sharers run sync or async, local or remote.

With the 4-Channel model, up to four sync controllers can share one host (via CSU/DSUs) in a polled environment. With the 2-Channel model, two devices can share one host.

Share two different ways. In Broadcast Mode, the host sends a polling message to all controllers simultaneously. After a port is selected, all the controllers continue to receive the host's transmissions. In Select Mode, only one device gets host transmissions until the host polls again.


V.35 Line Sharer, 4-Channel (TL570A)
CSU/DSU
V.35 Interface Cable (EYN450), p. 89
V.35 Interface Cable (EYN450), p. 89
56-Kbps Data Line
Controllers

SPECIFICATIONS

Contention Type — RTS/CTS
Operation — Synchronous; half- or full-duplex
Speed — TL555A: Up to 64 Kbps; TL570A: Up to 2.048 Mbps
CE Approval — 230-VAC version: TL570AE
Interface — Master port is DTE, slave port is DCE
Connectors — TL555A: (3) 34-pin M-block female; TL570A: (5) 34-pin M-block female
Indicators — TL555A: (6) LEDs: Power, RTS A, RTS B, and Master Port: CD, CTS, RXD; TL570A: (6) LEDs: TD, RD, RTS, CTS, DSR, RLSD
Power — 115/230 VAC, 60/50 Hz, 25 watts, wallmount transformer

Item	Code	Price
V.35 Line Sharers		
2-Channel	TL555A	**$595.00**
4-Channel	TL570A	**$1095.00**
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

For other lengths or genders, see p. 89.

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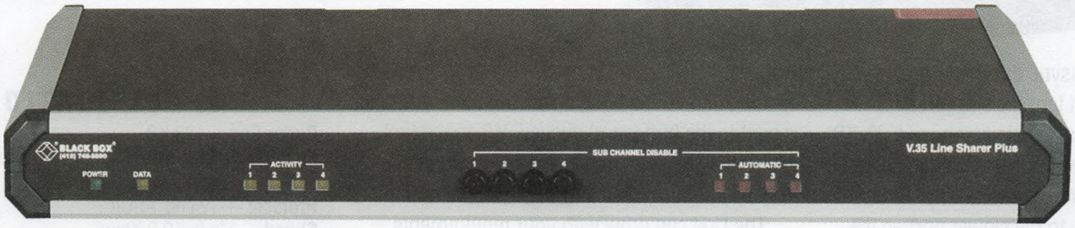
V.35 Line Sharer+

All *Four* One: Four DCEs or DTEs Can Share a Modem, Mux, or Port!



- **Any combination of four modems or terminals can share a modem, mux, or computer port.**
- **Synchronous data rates of 56 or 64 Kbps.**
- **Transparent to the system and data.**
- **Internal or external clocking.**

The BLACK BOX® V.35 Line Sharer+ enables any combination of up to four modems or terminals to share a modem, a multiplexor, or computer port in a multipoint environment. It operates synchronously at 56 or 64 Kbps.

The Line Sharer+ is completely transparent to the system and data. It generates timing signals internally or operates with external clocks either from the main channel or the first subchannel. An integral buffer accommodates the differences in clocking phases. The main channel broadcasts information to all subchannels in parallel. Subchannels contend to transmit to the main channel by activating RTS/DCD or by data transitions.

Installation and configuration are easy. Crossover connections are performed internally via a DCE/DTE switch. Only straight-through cables are used to connect modems or ports to the Line Sharer+.

SPECIFICATIONS

Buffer Size — 16-bit
Contention Type — RTS/DCD
Maximum Distance — 50 ft. (15.2 m)
Protocol — Sync
Maximum Speed — 64 Kbps
CE Approval — Yes
Interface — V.35
Connectors — Main Channel: (1) 34-pin M-block female; Subchannels: (4) 34-pin M-block female
Size — 1.7"H x 17"W x 8.2"D (4.3 x 43.2 x 20.8 cm)
Weight — 4.4 lb. (2.0 kg)

Item	Code	Price
V.35 Line Sharer+	TL571A	**$1200.00**
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

For other lengths or genders, see p. 89.

CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!

Data Broadcast Unit

Send Your Training Demo to 8 PCs—Simultaneously.

BLACK BOX
DB-8/25
CHANNEL
COMP 1 2 3 4 5 6 7 8
PWR

- **Send async data to as many as eight printers, terminals, or PCs.**
- **Ideal for polled environments.**
- **Choose DB25 or RJ-11 models.**
- **Save space with rackmountable models.**

For fast, reliable training sessions, go for our Data Broadcast Unit. Just put it between your async CPU and up to eight terminals. Students see everything on your screen—but only you have exclusive communication back to the host. This makes the Unit ideal for polling applications or other controlled environments. You can also use it for sending data to printers, plotters, and other slave devices.

The DB25 model enables you to connect each port directly—and quickly—to the slave ports.

The DB25 model is available as a Ready Pak that comes with (9) 10-ft. RS-232 Cables with a DB25 male and a DB25 female connector (ECM25C-0010-MF).

An RJ-11 model of the Data Broadcast Unit is available for modular wiring environments. Using RJ Modular Adapters (FA252, FA253), you can even connect it to premise DTEs equipped with DB25 connectors.

SPECIFICATIONS

Buffer Size — TL158A-R3, TL159A: none
Flow Control — TL158A-R3, TL159A: Software only, transparent to speed and data
Protocol — TL158A-R3, TL159A: Async, transparent
Speed — TL158A-R3, TL159A: Transparent
User Channels — TL158A-R3, TL159A: 8
CE Approval — 230-VAC version: TL158AE-R3
Interface — RS-232
Connectors — TL158A-R3: (9) DB25; TL159A: (9) RJ-11
Power — 115 VAC, 60 Hz
Size — TL158A-R3: 2.3"H x 12.2"W x 11.1"D (5.8 x 31 x 28.2 cm); TL159A: 1.5"H x 5.5"W x 8.5"D (3.8 x 14 x 21.6 cm)
Weight — TL158A-R3: 9.5 lb. (4.3 kg) TL159A: 2.4 lb. (1.1 kg)

FAXBACK INFORMATION
Request Document Number: 12252
Call 412-746-5500 Anytime

Item	Code	Price
Data Broadcast Unit		
DB25	TL158A-R3	**$369.00**
Ready Pak Includes: the DB25 Broadcast Unit **plus (9)** 10-ft. RS-232 Cables	TL158A-R3-CABPAK	**$584.55**
RJ-11	TL159A	**$275.00**
Rackmount Bracket	TL486	**$25.00**
RJ-11 model requires...		
RJ Modular Adapter		
Male	FA252	**$10.20**
Female	FA253	**$10.20**
remember to order cables RJ-11 (4-Wire) Modular Cable, 7-ft. (2.1-m) Straight-Pinned	EL04MS-07	**$2.95**

For other lengths and pinnings, see p. 71.

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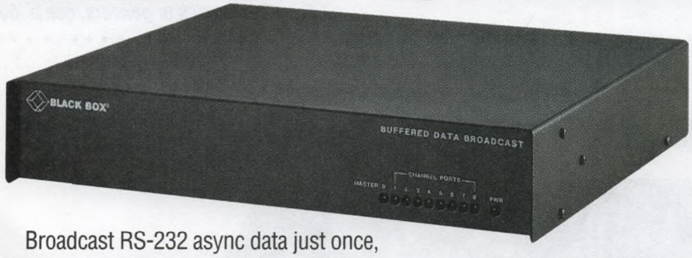
Buffered Data Broadcast Unit

Broadcast Data to Eight Printers or Terminals without Delay.



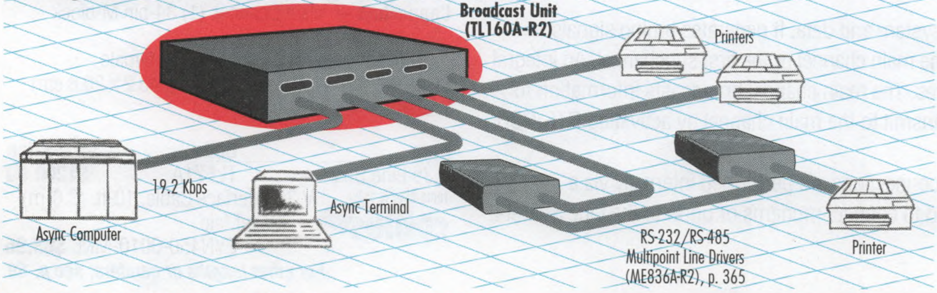
- **Buffer data individually for each port.**
- **Dynamically allocate memory.**
- **Configure each port individually.**
- **Send data to four or eight users (with Expansion Card).**

Broadcast RS-232 async data just once, simultaneously, to eight terminals or printers. The Buffered Data Broadcast Unit features a 32-KB buffer to handle overflow and keep data moving—even with a slow printer or terminal. The Unit allocates more memory to the slower port so the host can continute to transmit—and the faster units can continue to receive data.

This dynamic memory allocation works in both directions, too. For example, if a terminal is sending data to the host, data from other terminals is sent to the buffer and queued. When the first terminal ends its transmission, the Unit pulls the remaining information in order from the buffer.

The Unit can grow with your requirements. To add four users, just plug in the 4-Port Expansion Card. And you can double the Unit's memory by adding the 32K Memory Expansion Card.

Application to Printers and Terminals Using Line Drivers for Greater Distance


Buffered Data Broadcast Unit (TL160A-R2)
Printers
19.2 Kbps
Async Computer
Async Terminal
RS-232/RS-485 Multipoint Line Drivers (ME836A-R2), p. 365
Printer

SPECIFICATIONS

Buffer Size — 32 KB
Flow Control — Hardware or software, transparent to speed and data
Protocol — Async, ASCII
Speed — Up to 19.2 Kbps
User Channels — 4 (expands to 8)
CE Approval — TL160A-R2, TL160-C
Interface — RS-232
Connectors — (5) DB25 female
Power — 115 VAC, 60 Hz
Size — 2.3"H x 12.2"W x 11.1"D (5.8 x 31 x 28.2 cm)
Weight — 10.9 lb. (4.9 kg)

Item	Code	Price
Buffered Data Broadcast Unit	TL160A-R2	**$510.00**
4-Port Expansion Card	TL160-C	**$205.00**
32K Memory Expansion	TL484	**$28.70**
remember to order cables RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**

For other lengths, see p. 83.
Specify gender when ordering.

RS-485 Repeater Hub

The Machine for Exercising New RS-485 Options.

- **Expand your existing network.**
- **Add up to four additional RS-485 devices to any 2-wire network.**
- **Extend the distance to any RS-485 device.**
- **Transparent to data.**
- **Perfect for industrial and commercial applications.**

PORT 1
PORT 2
PORT 3
PORT 4
CPU
POWER
RS485 Repeater Hub
BLACK BOX
(412) 746-5500

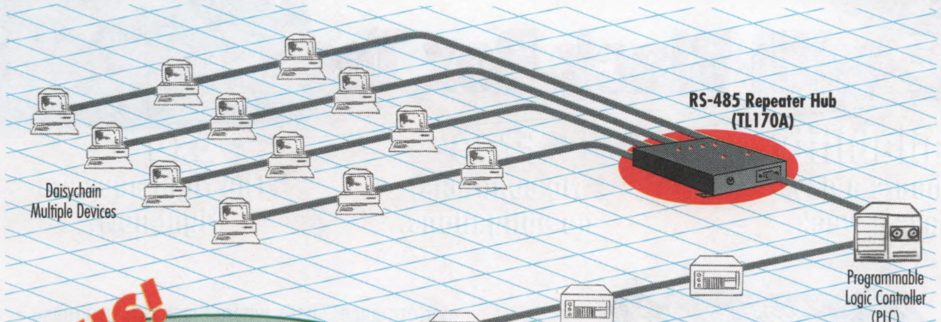
Expand your existing network—and extend the distance to any RS-485 device—with the BLACK BOX® RS-485 Repeater Hub.

The RS-485 Hub connects up to four additional devices to any 2-wire RS-485 port. Since it's a true 2-wire 485 device, it's compatible with your present networks.

You can expand your network to up to 128 transceivers—far beyond the RS-485 standard of 32 per terminated line. Don't worry about transmission quality. The Hub's internal amplifiers extend the distance to connected devices. And this Hub is transparent to data.

The Repeater Hub is perfect for any business environment, industrial or commercial.

FAXBACK INFORMATION
Request Document Number: 17525
Call 412-746-5500 Anytime



PLUS! RS-485 Interface Converters, **see pp. 322–323.**

SPECIFICATIONS

Protocol — Transparent
Speed — Up to 115.2 Kbps
CE Approval — 230-VAC version: TL170AE
Interface — 2-wire RS-485
Connectors — (5) DB9 female
Indicators — LEDs: (5) Receive Data (one for each data port), (1) Power
Power — 115 VAC, 60 Hz, 20 watts, from wallmount power supply (230-VAC version on request)
Size — 7"H x 5.6"W x 1.5"D (17.8 x 14.2 x 3.8 cm)
Weight — 3 lb. (1.4 kg) with power supply

Item	Code	Price
RS-485 Repeater Hub	TL170A	**$495.00**
remember to order cables DB9 Extension Cable (w/EMI/RFI Hoods) 10-ft. (3.0-m)	EDN12H-0010-MM	**$22.95**

For other lengths and genders, see p. 105.

* * *

Telco Line Bridge (TLB)

Send Data to Four Leased Lines via One Modem.

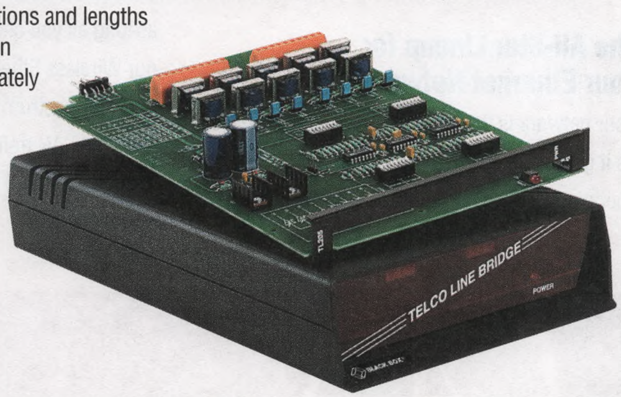
- **Sends one data signal to four separate leased lines via a single modem.**

PLUS! Leased-Line Modems, **see pp. 406–410.**

Combine your leased lines into a custom multipoint network. How? With the BLACK BOX® Telco Line Bridge. It consolidates your leased lines so you don't have to pay for a multipoint leased line. You keep control and save money.

Flexible enough to work locally or remotely, our Line Bridge can go wherever you need it—wherever the best place is to bridge your leased lines. The TLB distributes a 600-ohm line impedance to each extended line. Varying line conditions and lengths are no problem—you set the gain or attenuation of each port separately so you can tune each port to the conditions of the line it handles.

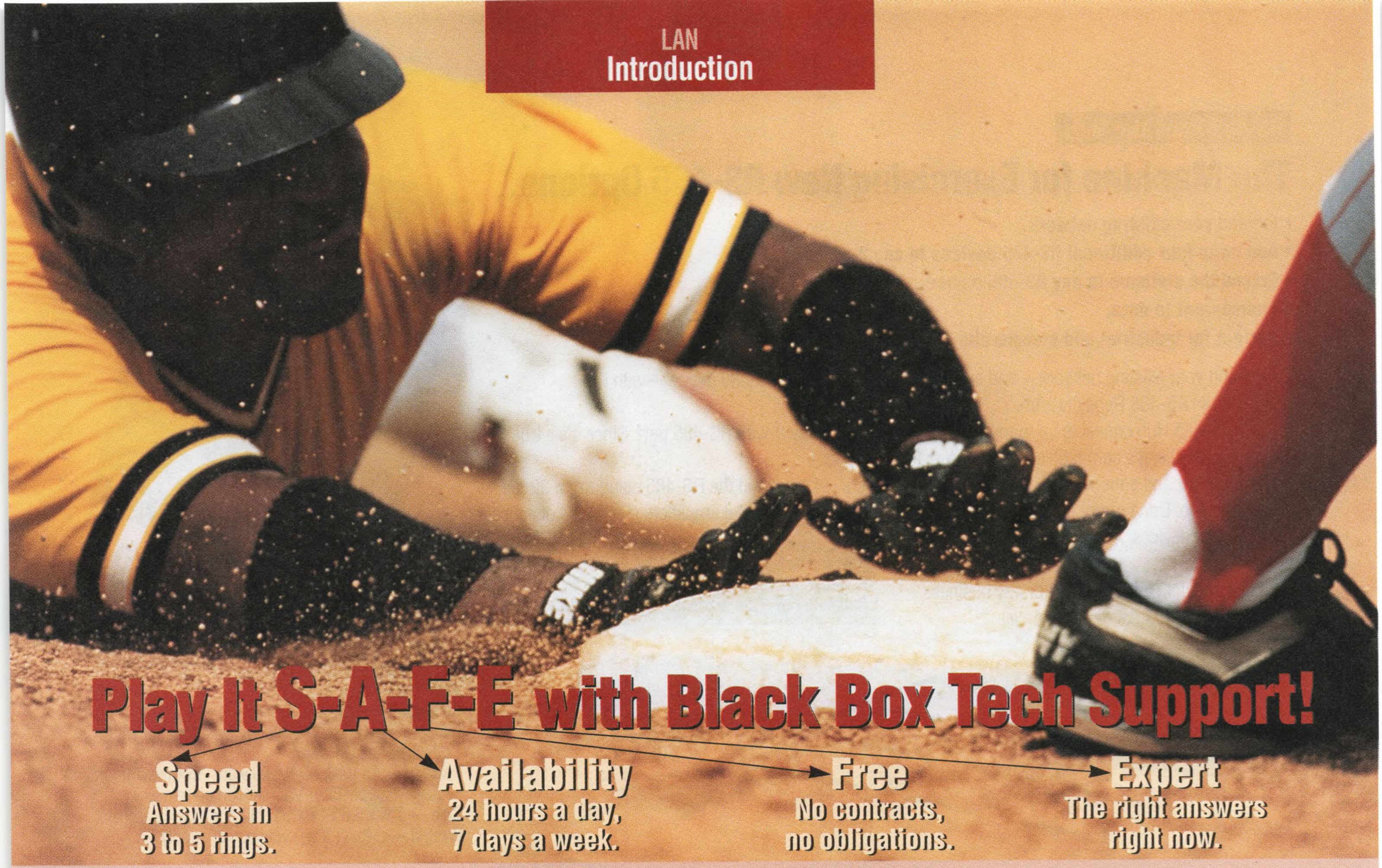
If you manage multiple leased lines, you can keep your setup organized and free from cable snarls—simply use the rackmount version of TLB and our 8-Card Rack.



SPECIFICATIONS

Line Impedance — 600-ohm, transformer-coupled
Operation — 4-wire, analog, full-duplex leased line
Receive Level — Same range as Transmit Level
Transmit Level — With 0 dBm input: -16 dBm to +16 dBm in 2-dB increments; independently selectable for each line
CE Approval — TL205C-R2; 230-VAC version: TL205AE-R2
Connectors — (2) 10-position terminal strips for up to 5 leased lines
Power — 115 VAC, 60 Hz, 5 watts
Size — 2.1"H x 8.8"W x 11.5"D (5.3 x 22.4 x 29 cm)
Weight — 3 lb. (1.4 kg)

Item	Code	Price
Telco Line Bridge (TLB)		
Standalone	TL205A-R2	**$260.00**
Rackmount Card	TL205C-R2	**$230.00**
8-Card Rack	RM060	**$425.00**


Play It S-A-F-E with Black Box Tech Support!
Speed
Answers in 3 to 5 rings.
Availability
24 hours a day, 7 days a week.
Free
No contracts, no obligations.
Expert
The right answers right now.

Connect Your Network—and Tag Up to the Rest of the World.

Telecommuters. Branch Offices. The Internet. Mobile Warriors. The Web. E-mail. These days, more and more people need to make the right calls into and out of your network. Plus you need access to everything the Information Superhighway has to offer. What can you do to keep connected and pick up the pace of your network? Well, with Black Box on your team, you'll get the products you need to keep your data moving and to guarantee reliable, secure access to all parts of your network—and beyond.

high-speed

Don't Be Left in the Dust—Speed up to 100 Mbps.

Is your network still running at 10 Mbps? Don't get tagged out! If you want the latest high-speed Ethernet technology, you've come to the right place. Black Box has the high-speed hubs, hardware and technical know-how to get your network on base at 100 Mbps. In other words, get moving—make the switch to Fast Ethernet today!

The All-Star Lineup for Your Ethernet Network.

Your network is the backbone of your business. As it grows, so does the likelihood that delays and operational problems will shut out your network's performance. That's where Black Box can make the save. From transceivers and print and fax servers to hubs and repeaters, Black Box has all-star solutions to every problem you may encounter. We also have the line on the hottest Ethernet technology around today—like our complete range of Media Converters (**pages 572–575**). Best of all, we have everything in stock and ready to ship to your major-league operation without delay.

Send Your Data Out of the Park.

Wireless, secure networking is here—as long as you choose Black Box. Scout out our Wireless Ethernet solution on **page 544**. Spread Spectrum technology routes your encoded LAN traffic safely through the air at speeds up to 3 Mbps. It's like a knock out of the park!

BLACK BOX
SOLUTIONS

Over 7000 Connectivity Solutions...

"My company is growing faster than I can handle! I'm planning to open two branch offices, so I need to make sure everyone connects with our central office. With the number of routers and remote-access products Black Box offers, I'm guaranteed to find the exact products I need."

If you want to remain competitive in today's market, you need to expand your network quickly and easily. That can be quite a challenge, especially if you're developing remote office locations or looking to take advantage of the Internet. But it doesn't have to be overwhelming—if you stick with Black Box.

Start with our Router Tutorial (**pages 500–523**). You'll learn everything you need about routers to find the best products to expand your growing business. And if the routers aren't enough to keep your users connected, we have enough Remote-Access products (**pages 532–543**) to get the job done. When you need to jump-start your traditional Ethernet LAN, check out the high-speed section (**pages 474–499**) and find out how you can upgrade to 100 Mbps. Plus, we've included an entire section devoted to Ethernet switches (**pages 476–487**) so you're up to date with the latest technology. What else could you possibly need?

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MORE! LAN Equipment! HOT NEW PRODUCTS

And the List Keeps Growing...

intel.

Cisco Systems
PARTNER
PREMIER RESELLER
PENNSYLVANIA

Bay Networks

3Com®

USRobotics®
The Intelligent Choice in Information Access

At Black Box, we understand that you need a variety of options to keep your network up and running. That's why we offer more than 7000 solutions to the problems that affect your network's operations. And that's why Black Box has become partners with Cisco, Intel®, 3Com®, Bay Networks, and U.S. Robotics®. They're the names you've come to trust over the years—just like Black Box. And since they're part of the Black Box team, you're guaranteed to find the equipment—and the technical support—you want.

What's more, every member of our Technical Support Staff is trained to handle *any* question or problem you may have about these products—and every other product we carry. And they're available 24 hours a day, 7 days a week. You can't find support like that anywhere else. Plus, you have access to every other Black Box advantage: same-day shipping, quality products in stock, and fair prices.

We've said it before, but it's true: Why go anywhere else? Black Box—*The World's Source for Connectivity℠.*

***Cisco Series 1600 Modular Ethernet Router** (CISCO1601)*

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High-Speed, Bridges and Routers, Remote Access, Wireless, Network Management, Ethernet, Token Ring, NetWare®, AppleTalk®, ARCNET® CD-ROM

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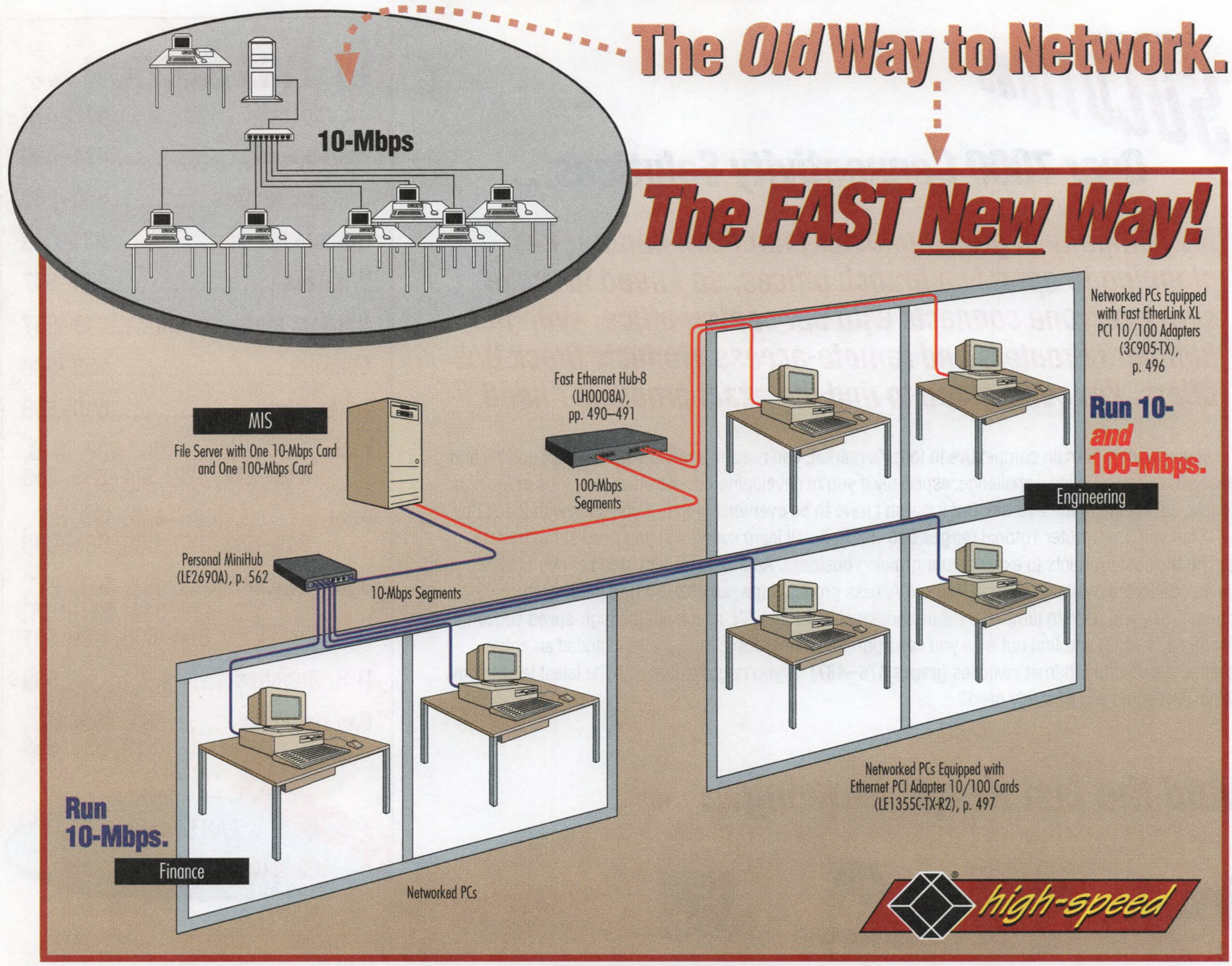

The Old Way to Network.
10-Mbps
The FAST New Way!
Networked PCs Equipped with Fast EtherLink XL PCI 10/100 Adapters (3C905-TX), p. 496
Fast Ethernet Hub-8 (LH0008A), pp. 490–491
MIS
File Server with One 10-Mbps Card and One 100-Mbps Card
100-Mbps Segments
Run 10- and 100-Mbps.
Engineering
Personal MiniHub (LE2690A), p. 562
10-Mbps Segments
Networked PCs Equipped with Ethernet PCI Adapter 10/100 Cards (LE1355C-TX-R2), p. 497
Run 10-Mbps.
Finance
Networked PCs
high-speed

Black Box Explains...

100-Mbps Fast Ethernet.

The bad news is that as technology evolves, many LAN administrators are discovering that 10-Mbps Ethernet is no longer fast enough to keep up with the demand for network services.

The good news is that 100-Mbps Fast Ethernet offers a relatively simple, comparatively affordable solution for moving your Ethernet into the fast lane. In fact, Fast Ethernet is quickly becoming the networking topology of choice. And if industry analysts are correct, it may soon replace 10-Mbps Ethernet as the primary networking topology.

There are several reasons for this popularity:

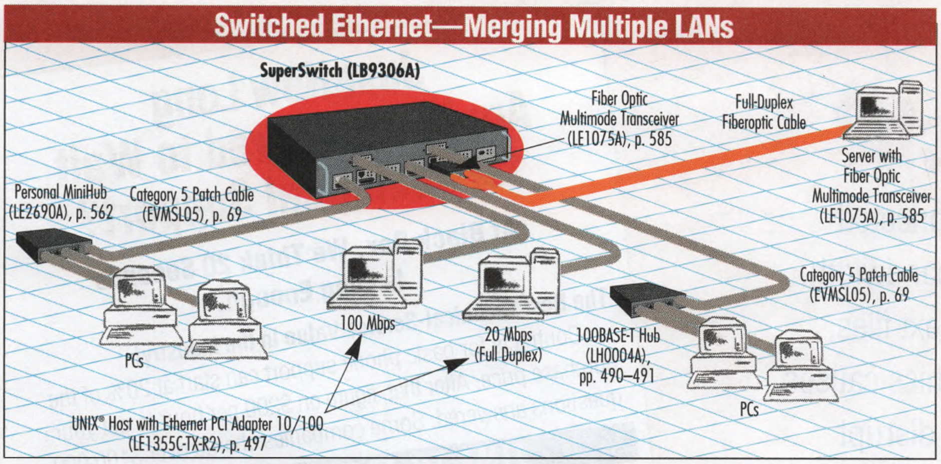
Familiarity—100-Mbps Ethernet is a natural outgrowth of 10-Mbps Ethernet—the dominant LAN technology throughout the world. Network managers already know how to establish and maintain an Ethernet LAN. Upgrading to Fast Ethernet is simply building on that foundation.

Compatibility—Fast Ethernet retains the same data format and protocols as standard 10-Mbps Ethernet. Other high-bandwidth technologies implement entirely new protocol schemes. Choosing these would require time-consuming, *expensive* software replacements to move data from a 10BASE-T segment to a faster new segment. But because Fast Ethernet maintains the 10-Mbps Ethernet protocol, data is exchanged easily between 10- and 100-Mbps segments.

Fast Ethernet is compatible with all current 10BASE-T applications and networking software, and it can be managed using existing SNMP software and Ethernet MIBs.

Wiring Flexibility—Fast Ethernet can run on a variety of popular wiring schemes. Unshielded twisted-pair cable, shielded twisted-pair cable, and single-mode and multimode fiberoptic cable can all carry Fast Ethernet data. This means you can add it to your existing network without costly rewiring—an important consideration for

Switched Ethernet—Merging Multiple LANs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Full-Duplex Fiberoptic Cable
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Personal MiniHub (LE2690A), p. 562
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100BASE-T Hub (LH0004A), pp. 490–491
PCs
PCs
UNIX® Host with Ethernet PCI Adapter 10/100 (LE1355C-TX-R2), p. 497

Move *Your* Ethernet into the *Fast Lane*—

Black Box Makes 100-Mbps Upgrades Easy.

Ten years ago, running an Ethernet LAN was relatively simple. You set up your workgroups and everyone worked happily, sharing data files, printers, and e-mail messages. Who'd have ever dreamed your robust, 10-Mbps network would become a bottleneck?

But today, with desktop PCs running Pentium® chips to process graphic-intensive and multimedia applications, 10-Mbps Ethernet just isn't enough, and there's a constant demand for more power and faster speed.

Fast Ethernet is Your *Simple* Solution. As a network administrator, your job is to deliver that speed, but your challenge is to do it economically, and with minimal disruptions to your existing LAN. And *that's* the beauty of choosing 100-Mbps Ethernet solutions from Black Box: It's painless!

See How Easy It Is to Upgrade. The illustration on the **facing page** shows how easily you can integrate Fast Ethernet on an existing LAN—just by plugging in a few new components. It uses the same data format and protocols of 10-Mbps Ethernet, and it runs over low-cost twisted-pair cable, so it's easy to implement, and you don't have to relearn everything you know about networking to get ***10 times the speed*** of your current LAN!

The diagram **above** shows how a Switched Ethernet solution can give you the flexibility to customize your LAN and run multiple segments at multiple speeds.

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justifying the expense of an upgrade.

Note that there are three cabling variations of Fast Ethernet: **100BASE-TX** for two-pair Category 5 UTP and Type 1 STP cable; **100BASE-T4** for Category 3, 4, and 5 UTP cable; and **100BASE-FX** for two-pair fiberoptic cable.

Built-In Migration Path—Fast Ethernet supports auto-negotiation of media speed, which means that special dual-speed devices such as adapter cards and hubs can be installed on networks running either 10- or 100-Mbps Ethernet.

Managers contemplating 100-Mbps upgrades can purchase 10-/100-Mbps equipment and run it on an existing 10BASE-T LAN, then use the same equipment to upgrade to Fast Ethernet.

Scalability—Fast Ethernet can provide top data rates on any size LAN—from a two-user workgroup to a thousand-user enterprise. Managed or unmanaged, all kinds of networks in all kinds of applications can benefit—right now—from the promise of 100-Mbps Fast Ethernet.

Your *BEST* Bet for *FAST* Networking— Any new technology brings new questions and concerns. But when it comes to increased bandwidth and better network performance, Fast Ethernet is the best answer for companies looking for an easy, yet effective solution.

With Fast Ethernet, there are no new protocols to implement, no costly rewiring required, and no reason to completely overhaul the networking environment you've built and come to understand so well over the years.

The shift to Fast Ethernet can be done as gradually or as quickly as necessary. Armed with Black Box equipment and our expert technical advice, you can design a high-performance, cost-effective, 100-Mbps network of any size.

Call Black Box Today to Find Out More!

VIPreview
Ask for our
High-Speed VIPreview.

SPEED

What Is an Ethernet Switch?

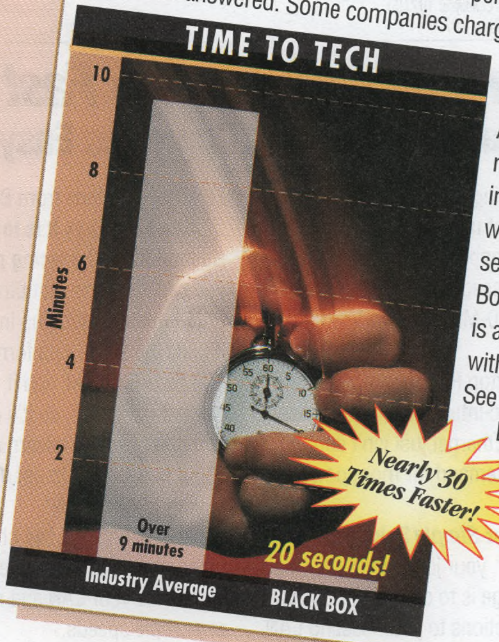
On an Ethernet LAN, every user connected to a Hub must share the available bandwidth. And sending or receiving multiple text files, large spreadsheets, and color graphics causes bottlenecks and congestion, which disrupt network performance. An Ethernet switch directs network traffic and relieves congestion in the Ethernet backbone and in the workgroup—anywhere you have a large number of users sharing Ethernet bandwidth. The switch takes the data and divides it into smaller, easier-to-manage segments. As a result, every port on the switch represents a dedicated 10-Mbps—or 100-Mbps—path or highway, that doesn't have to share its bandwidth.

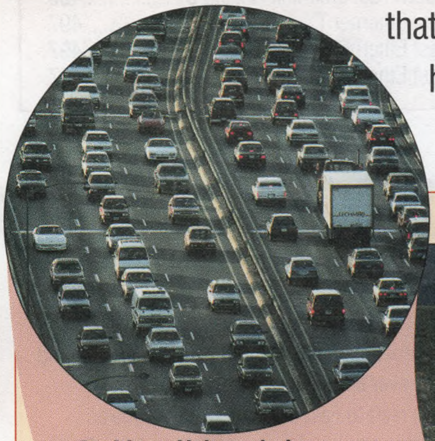
Just How Long Are You Prepared to Wait for Technical Support?

At Black Box, We Think 20 Seconds Is Long Enough.

The Best Technical-Service Value in the Industry!

Contracts for basic phone support can start at 20% of the purchase price. After that, figure on $200 per hour to get your questions answered. Some companies charge over $100,000 for premium technical support. And what's the return on your investment? Long waits and high-cost service. But at Black Box, our best advice is always FREE—with no long wait. See the Black Box Bottom Line on pages 480–481!





Problem: Using a hub on your Ethernet LAN forces every user to share bandwidth and wait his turn to send and receive data. As a result, your LAN becomes congested—just like your local highway during morning rush hour.

BLACK BOX SOLUTION By adding a switch to your LAN, each user has his own dedicated link—a wide open, easy-to-travel, and traffic-free highway! And with a full 10- or 100-Mbps pathway, there's no need to share bandwidth!

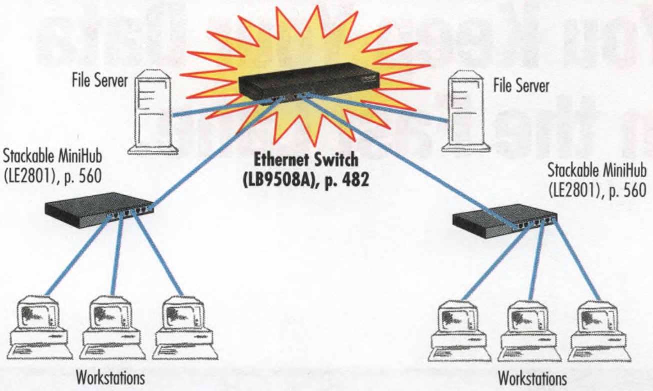
Common Switch Applications

Although Ethernet switches have a variety of uses, the following are the two most common switch applications: sharing multiple file servers and adding high-speed workgroups to your existing network.

Ethernet Switch

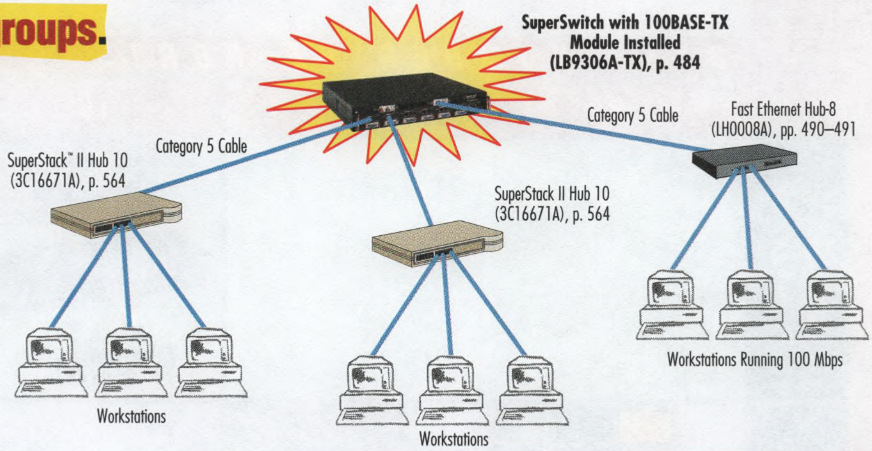
1. Multiple File Servers.

With multiple users on your network, each attached device attempts to send data, receive files, and transmit signals simultaneously. Since it's an Ethernet network, all attached devices hear every signal transmitted—and that means congestion and traffic can delay your network. With an Ethernet Switch installed on your network, traffic is segmented and data is only sent to and heard by the appropriate destination.


File Server
File Server
Stackable MiniHub
(LE2801), p. 560
Ethernet Switch
(LB9508A), p. 482
Stackable MiniHub
(LE2801), p. 560
Workstations
Workstations

2. Adding High-Speed Workgroups.

You need to add a high-speed workgroup to your 10-Mbps LAN—but you're not prepared to make the full switch to 100 Mbps. With an Ethernet Switch in place, you can provide a dedicated high-speed link to the users who need it while segmenting traffic throughout the rest of your network.


SuperSwitch with 100BASE-TX
Module Installed
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Category 5 Cable
SuperStack™ II Hub 10
(3C16671A), p. 564
SuperStack II Hub 10
(3C16671A), p. 564
Workstations
Workstations
Workstations Running 100 Mbps

Do You Need an Ethernet Switch?

An Ethernet Switch is used for a variety of applications. If you:

- need to reduce the amount of traffic on your network;
- have two or more file servers on your network;
- have one file server with multiple peer-to-peer workgroups;
- need to add a high-speed workgroup to an existing 10-Mbps LAN;
- plan to migrate your 10-Mbps network to 100 Mbps;
  an Ethernet Switch can improve your network's performance.

You can use these pages to:

- Become familiar with Ethernet Switches;
- Determine if you need an Ethernet Switch;
- Identify common Ethernet Switch applications;
- Find appropriate products to suit your network's needs and improve overall performance.

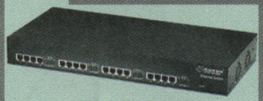
BLACK BOX® Ethernet Switches

Turn the page to find out more!

Black Box Can Help You Keep Your Data in the Fast Lane.

Consider This before Selecting an Ethernet Switch:

1. At what speed do you want your network to operate?
2. How many devices will you connect to the Switch?
3. Does your network need half- or full-duplex operation?
4. Do you need any uplink ports?
5. Do you need any other features (listed on page 479) in your Switch? (For more information on these features, see pages 480–481.)

	Fixed					
	BASE NUMBER OF PORTS:					
SPEED	2	5	16	24	5	
10 Mbps			 **Black Box Ethernet Switch** (page 482)			
10/100 Mbps	**Black Box Two-Port 10/100 Ethernet Switch Family** (page 482)	**3Com® OfficeConnect® Switch 140** (page 482)		**BayStack 2216T, 301, 302 Ethernet Switches** (page 483)		
100 Mbps					**Black Box Fast Ethernet Switch** (page 487)	

Confused about the Best Switch for Your Needs?

Give our Expert Technical Support Staff a call, and they'll point you in the right direction. Plus, they're available 24 hours a day, 7 days a week, so you can reach them whenever *you* need them.

TECH SUPPORT · OUR BEST PRODUCT!

CISCO SYSTEMS
PARTNER
PREMIER RESELLER
PENNSYLVANIA

Black Box has always provided its customers with the best technical support. Now, as a **Cisco Premier Certified Reseller**, our Technical Support Staff is trained and certified by Cisco to support every Cisco product we carry. And that means our techs have the product knowledge, technical expertise, and support capabilities you need. Our Technical Support Staff is always available to assist you—and every call is FREE! Where else can you find the products and support you demand? Nowhere but Black Box—*The World's Source for Connectivity℠.*

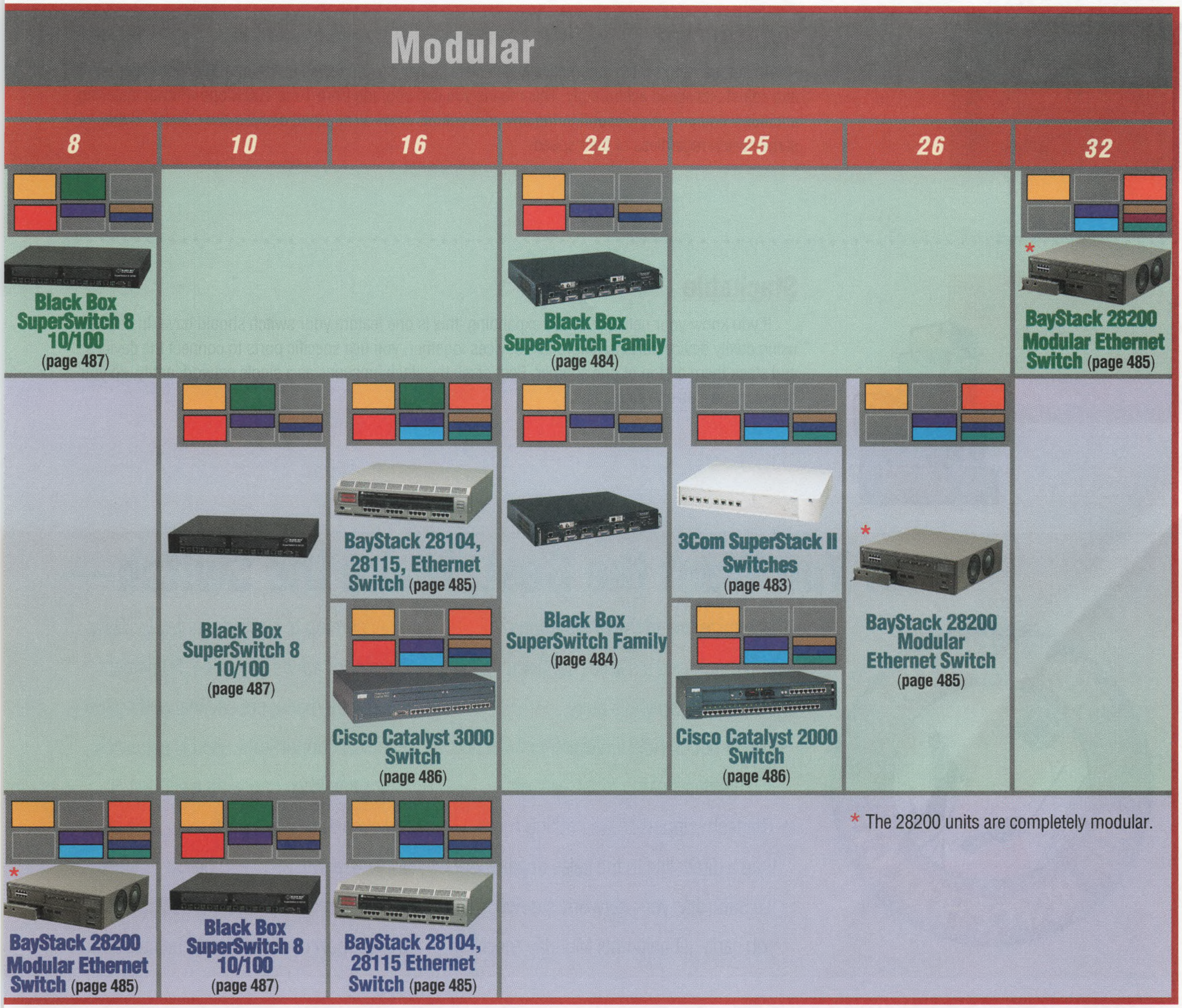
FEATURES LEGEND

Full-Duplex	Autosensing	Stackable
Full-Duplex	**Autosensing**	**Stackable**
Uplink	Switching Engine	Managed
Uplink	**Store & Forward** **Cut-Through**	**RMON** **SNMP** **Telnet**™

BLACK BOX® Ethernet Switches

For more details, see pages 480–481.

Modular



8	10	16	24	25	26	32
Black Box SuperSwitch 8 10/100 (page 487)			**Black Box SuperSwitch Family** (page 484)			* **BayStack 28200 Modular Ethernet Switch** (page 485)
	Black Box SuperSwitch 8 10/100 (page 487)	**BayStack 28104, 28115, Ethernet Switch** (page 485) **Cisco Catalyst 3000 Switch** (page 486)	**Black Box SuperSwitch Family** (page 484)	**3Com SuperStack II Switches** (page 483) **Cisco Catalyst 2000 Switch** (page 486)	* **BayStack 28200 Modular Ethernet Switch** (page 485)	
* **BayStack 28200 Modular Ethernet Switch** (page 485)	**Black Box SuperSwitch 8 10/100** (page 487)	**BayStack 28104, 28115 Ethernet Switch** (page 485)				

* The 28200 units are completely modular.

Ethernet Switch Features

Full-Duplex

Full-
duplex

Full-Duplex

A full-duplex transmission is a point-to point connection enabling two stations to send and receive data at the same time. Since it uses entirely different lines for transmit and receive, Ethernet distance limitations and collisions are virtually eliminated and data-transmissions are more efficient.

Theoretically, by using full-duplex Ethernet switches, you can *double* the throughput of traditional Ethernet—and sustain a 100% network load at 20 Mbps. In practice, you can expect about a 20% increase in efficiency over half-duplex Ethernet, or even a 60% increase in heavily loaded environments.

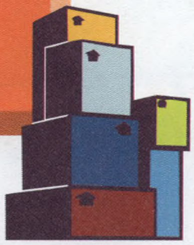
You can also double the throughput of Fast Ethernet. In general, full-duplex transmissions are more common in high-speed environments than in 10-Mbps environments.

Autosensing

Autosensing

An autosensing switch automatically detects whether it's connected to 10- or 100-Mbps Ethernet and adjusts its speed accordingly. This means you can upgrade from 10 to 100 Mbps without installing additional equipment or reconfiguring any connections since all attached devices can coexist on the same switch regardless of their speed.

Stackable



Stackable

If you know your network will be expanding, this is one feature your switch should have. Instead of using costly device ports to daisychain devices together, you use specific ports to connect the devices and stack them on top of one another. Best of all, the stack functions as a single network entity, so you can manage it as one single unit.

If You Want the Best, Make the Switch—

TECH SUPPORT
OUR BEST PRODUCT!

Recognize any of these situations?

- You purchased a service contract, but the line is always busy.
- You're put on hold while the tech spends 30 minutes looking for an answer.
- The tech support line is nothing more than a direct line to the sales department.
- It's Saturday, your network is down, but you can't get help until Monday morning.

According to a recent survey by *Data Communications* magazine, 90 percent of network managers say that getting the technical support they need is extremely important when choosing a vendor. But even though network managers pay anywhere from 10 to 20 percent of their overall purchase price for a basic service and support contract, the technical support

and What They Mean:

Uplink

An uplink port on an Ethernet Switch links the Switch and its connected network to a larger or faster network. Switches can come equipped with varying numbers of uplink ports, and these ports can be built-in (fixed) or modular slots. This gives you the flexibility to choose the speed or cabling you want.

Switching Engine

Cut-Through
Store & Forward

The two types of Ethernet switching engines are Store-and-Forward Switching and Cut-Through Switching.

Store-and-Forward Switching means that the Switch holds on to a packet and checks its integrity before passing it on to its destination port. This switching type is preferable when data integrity is important.

In **Cut-Through Switching**, the Switch reads the Ethernet address and passes the packet straight through without first checking the integrity of each packet. This switching type is better when speed is a top priority.

Managed

RMON
SNMP
TELNET™

RMON (Remote Network Monitoring) is a standard for monitoring and reporting network activity and was designed to supplement the management information obtained by SNMP. RMON provides information about the operation and performance of entire networks or subnetworks.

SNMP (Simple Network Management Protocol) is the preferred tool for managing local area networks. Working from a centrally located computer, you can reconfigure devices or communicate with routers, switches, and other devices for up-to-date performance information. What's more, you receive this information within minutes—and you never have to leave your office.

TELNET™ is a protocol that provides terminal-emulation capabilities and enables users to log in to a remote network from their computer.

Call Black Box Today !

and service they receive falls far short of their expectations—and certainly isn't worth the $10,000–$100,000 they paid.

At Black Box, we offer the best value and the best support. Take a look at the figures **at right** and see for yourself how we compare. Why take a chance with anyone else—call Black Box today!

The Black Box Bottom Line!

	Cost of (2) Catalyst 3000 Switches		(2) 1-Year SMARTnet™ Contracts & (2) 1-year renewals		Actual Cost of (2)
The Competition:	$8613.00	+	$2000.00*	=	$10,613.00
From Black Box:	$9570.00	+	FREE!**	=	$9570.00

**Telephone Technical Support only Available 9–5—no weekend or holiday service*

** Takes up to ONE HOUR to return your call*

***Available all day, every day*

***Immediate response —calls answered within 3–5 rings*

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✓ Save $1043!

✓ Get FREE Technical Support!

✓ No Contracts!

10/100 Mbps Mbps Fixed
Up to 2 Ports

Two-Port 10/100 Ethernet Switch Family

The Low-Cost 10/100 Choice for Switching Technology.

- Store-and-forward switching engine.
- Extends Fast Ethernet backbone applications up to 100 km.
- Versions available with UTP, fiberoptic, or redundant fiberoptic as second port.
- Wire-speed filtering and forwarding of traffic and error frames.

high-speed

SPECIFICATIONS

Duplex Support — Half and full
Speed — 10/100 Mbps
CE Approval — All items listed are approved
Connectors — LB9800A: (1) RJ-45 10/100 Mbps manual switched, (1) RJ-45 100BASE-TX; LB9801A: (2) RJ-45 10/100 Autosensing; LB9802A–LB9804A: (1) RJ-45 10/100 Autosensing, (1) fiber for single- or multimode
Power — LB9800A: 90–260 VAC, 47–63 Hz, autosensing; All others: 100–240 VAC, 50–60 Hz, autosensing
Size — LB9800A: 1.3"H x 6.1"W x 9.1"D (3.3 x 15.5 x 23 cm); All others: 1.8"H x 8"W x 10"D (4.6 x 20.3 x 25.4 cm)
Weight — LB9800A: 1.6 lb. (0.7 kg); All others: 2.3 lb. (1 kg)

Item	Code	Price
Two-Port 10/100 Ethernet Switch Family		
(1) 10/100 UTP Port with (1) 100BASE-TX Port	LB9800A	**$895.00**
Dual 10/100 UTP Port	LB9801A	**$825.00**
(1) 10/100 UTP Port with (1) 100BASE-FX Port		
for Multimode Fiber (up to 2 km)	LB9802A	**$1045.00**
for Single-Mode Fiber (up to 18 km)	LB9803A	**$1360.00**
for Single-Mode Fiber (up to 40 km)	LB9804A	**$1515.00**

Item	Code	Price
remember to order cables	Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	
	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		
Bulk Duplex Fiber Optic Cable, PVC		
ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
For other lengths or terminated cable, see pp. 74–76 and 117–118.		

FAXBACK INFORMATION
Request Document Number: 18557
Call 412-746-5500 Anytime

* * *

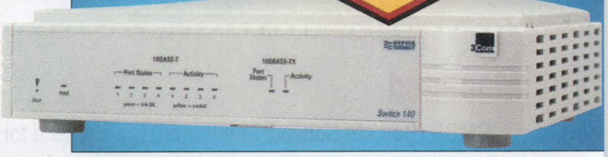
10/100 Mbps Mbps Fixed
Up to 5 Ports

3Com OfficeConnect Switch 140

Link Your OfficeConnect® Devices to 10- and 100-Mbps Ethernet—without Delay.

high-speed

New



GUARANTEED ABSOLUTELY FOR LIFE

3Com®

- Store-and-forward switching engine.
- Offers complete connectivity and centralized management.
- Provides power users wire-speed access to devices on your LAN and beyond.

SPECIFICATIONS

Duplex Support — Half
Uplink Ports — Fixed: (1) switched 100BASE-TX
Speed — 10/100 Mbps
CE Approval — Yes
Connectors — (4) RJ-45 10BASE-T and (1) RJ-45 100BASE-TX
Power — 18 VAC
Size — 22.1"H x 5.3"W x 18.5"D (22.1 x 5.3 x 18.5 cm)
Weight — 2.1 lb. (1 kg)

FAXBACK INFORMATION
Request Document Number: 18801
Call 412-746-5500 Anytime

Item	Code	Price
OfficeConnect Switch 140	3C16730	**$899.00**

* * *

10 Mbps Fixed
Up to 16 Ports

Ethernet Switch

Filter and Switch Your Data Simultaneously—and We Throw in the Management Software.

FREE CONTROL! Software $600 Value

high-speed

- Store-and-forward switching engine.
- Supports SNMP management.
- Plug-and-Play autolearning for up to 2000 Ethernet addresses.
- Fowards and filters data at wire speed—regardless of packet size.
- In-band management enables you to view and control the network from any workstation running CONTROL! software (**see p. 555**).

SPECIFICATIONS

Duplex Support — Half
Speed — 10 Mbps
CE Approval — All items listed are approved
Connectors — LB9508A: (8) RJ-45; LB9616A: (16) RJ-45
Power — 100–240 VAC, 50–60 Hz, 40 watts, autosensing power supply
Size — 1.7"H x 8.8"W x 17.9"D (4.3 x 22.4 x 45.5 cm)
Weight — 5 lb. (2.2 kg)

FAXBACK INFORMATION
Request Document Number: 13284
Call 412-746-5500 Anytime

Item	Code	Price
Ethernet Switch		
8-Port	LB9508A	**$1195.00**
16-Port	LB9516A	**$1795.00**
remember to order cables	Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	
	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		

10/100 Mbps Mbps **Fixed** Up to 24 Ports

Bay Networks

BayStack Ethernet Switches

Powerful Desktop Switching Solutions for High-Performance Networks.

- Store-and-forward and cut-through switching engines.
- Supports RMON, SNMP, and Telnet™ management.
- The perfect way to introduce desktop switching to your power workgroups.

MORE! Bay Networks solutions, see pp. 485, 493, 519, 554, 563.

New

high-speed

FAXBACK INFORMATION
For 301 Desktop Ethernet Switch: 17563,
For Model 2216T Ethernet Switch: 18502,
For 302 Ethernet Switch: 18492,
Call 412-746-5500 Anytime

Bay Networks *from* BLACK BOX

Why? Technical Support.

Choosing the right product *can* be confusing. But at Black Box, our Technical Support Experts can provide you with the answers you need to get the best equipment for your application. No one knows these Switches better, and 90 percent of the time, you'll talk to our experts within 20 seconds—the fastest response time around. Remember: Our technical staff is available to help you 24 hours a day, 7 days a week so you can reach us whenever you need us—without delay.

SPECIFICATIONS

Duplex Support — Full
Speed — 10 Mbps
Uplink Ports — Fixed: CW2001001: (2) 100BASE-TX; DF1901001, AL2001002: (1) 100BASE-TX; AL2001003: (1) 100BASE-FX
CE Approval — All items listed are approved
Connectors — CW2001001: (22) RJ-45 for 10-Mbps transmissions, (2) RJ-45 for 100-Mbps transmissions, (1) DB9 male RS-232
DF1901001: (16) RJ-45, (1) DB9;
AL2001002: (8) RJ-45, (1) 100BASE-T RJ-45, (1) DB9;
AL2001003: (8) RJ-45, (2) ST-type 100BASE-FX, (1) DB9
Power — CW2001001: 115–230 VAC, 60 watts maximum;
DF1901001, AL2001002–AL2001003: 100–240 VAC, 50–60 Hz
Size — CW2001001: 1.8"H x 17.2"W x 11"D (4.4 x 43.7 x 27.9 cm);
DF1901001, AL2001002–AL2001003: 1.8"H x 17.5"W x 9.5"D (4.5 x 44.2 x 33 cm)
Weight — CW2001001: 7.5 lb. (3.4 kg);
DF1901001, AL2001002–AL2001003: 10 lb. (4.5 kg)

Item	Code	Price
BayStack 301 Desktop Ethernet Switch	CW2001001	**$3995.00**
BayStack Model 2216T Ethernet Switch	DF1901001	**$1895.00**
BayStack 302 Ethernet Switch (8) 10BASE-T and (1) 100BASE-TX Switched Ports	AL2001002	**$2245.00**
(8) 10BASE-T and (1) 100BASE-FX Switched Ports	AL2001003	**$2965.00**
remember to order cables Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

◆ ◆ ◆

10/100 Mbps Mbps **Modular** Up to 25 Ports

3Com SuperStack II Switches

High-Performance Switching Ideal for Managing Workgroups and Boosting Network Performance.

New

3Com®

- Store-and-forward and cut-through switching engines.
- Supports RMON, SNMP, and Telnet management.
- The perfect performance booster: Get 10 Mbps—full wire speed—on each port.
- Supports "fat pipe" server or backbone links to 155 Mbps for Fast Ethernet, FDDI, or ATM.

high-speed

FAXBACK INFORMATION
Request Document Number: 18533
Call 412-746-5500 Anytime

SPECIFICATIONS

Duplex Support — Half
Speed — 10/100 Mbps
Uplink Ports — 3C220000A: Fixed: (1) FDDI; Modular: (1) 10 Mbps;
All others: Fixed: (1) 100 Mbps; Modular: (1) 100 Mbps, (1) 10 Mbps
CE Approval — All items listed are approved
Connectors — 3C16901A: (12) Switched RJ-45;
3C16900A: (24) Switched RJ-45;
3C220000A: (16) Switched RJ-45, (1) FDDI;
3C32700A, 3C32710A, 3C2711A: (12) RJ-45 plus:
3C32700A: (1) OC-3C ATM on multimode fiber;
3C32710A: (1) DS-3 ATM;
3C2711A: (1) OC-3C ATM on single-mode fiber;
3C16940A: (5) Fiber, (1) RJ-45;
3C16941A: (8) RJ-45 100BASE-TX ports
Power — 115–230 VAC, 50–60 Hz, autosensing
Size — 3C16900A–3C16901A: 2.8"H x 17.3"W x 12"D (7 x 44 x 30 cm);
3C220000A: 2.5"H x 17.3"W x 14.5"D (6.4 x 44 x 36.8 cm);
3C32700A, 3C32710A–3C32711A: 1.8"H x 17.3"W x 11"D (4.6 x 44 x 28 cm);
3C16940A–3C16941A: 2.8"H x 17.3"W x 12"D (7.1 x 43.9 x 30.5 cm)
Weight — 3C16900A–3C16901A: 9.6 lb. (4.5 kg);
3C220000A: 10 lb. (4.7 kg);
3C32700A, 3C2710A–3C32711A: 5.5 lb. (2.6 kg);
3C16940A–3C16941A: 9 lb. (4 kg)

Item	Code	Price
3Com® SuperStack II Switches		
Switch 1000		
12-Port	3C16901A	**$2059.00**
24-Port	3C16900A	**$2589.00**
Switch 2200	3C220000A	**$4999.00**
Switch 2700, 12 Ethernet plus		
1 MultiOC-3C	3C32700A	**$6419.00**
1 DS-3 ATM	3C32710A	**$7339.00**
1 SGL OC-3C ATM	3C32711A	**$9549.00**
Switch 3000 FX 5 FB/1 RJ-45	3C16940A	**$8249.00**
Switch 3000 TX 8 RJ-45	3C16941A	**$3089.00**
remember to order cables Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

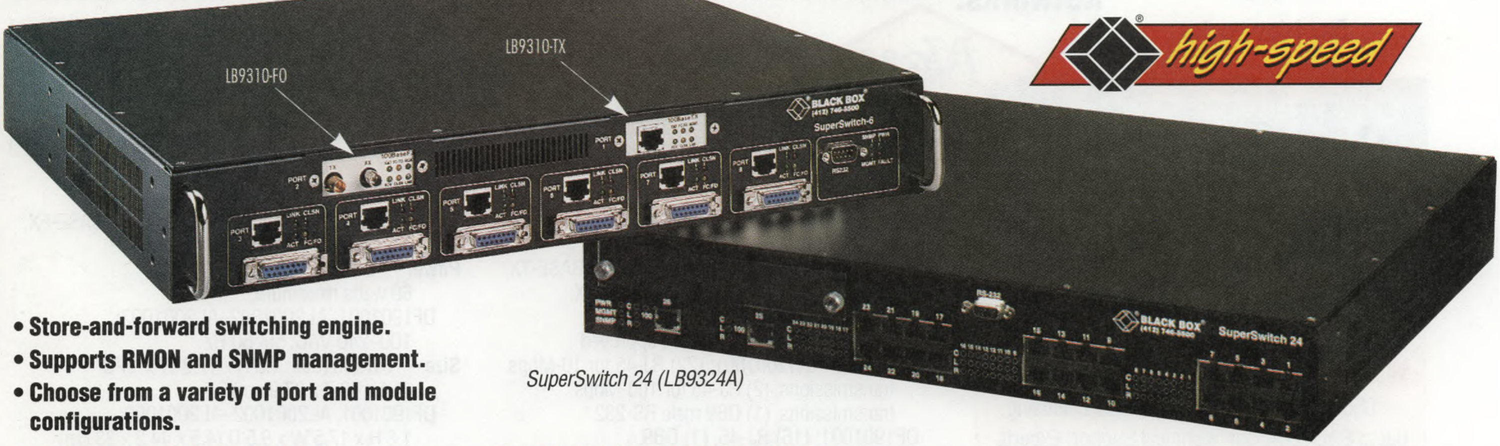
For other lengths and colors, see p. 69.

10 Mbps Modular
Up to 24 Ports

10/100 Mbps Modular
Up to 24 Ports

SuperSwitch Bring High-Speed Switching Technology to Your Entire Network.

SuperSwitch-6 (LB9306A)


LB9310-FO
LB9310-TX

SuperSwitch 24 (LB9324A)

- **Store-and-forward switching engine.**
- **Supports RMON and SNMP management.**
- **Choose from a variety of port and module configurations.**

SuperSwitch 6 and SuperSwitch 13

Each SuperSwitch provides six AUI/RJ-45 ports for connecting 10-Mbps Ethernet segments. The 13-Port model gives you an additional seven RJ-45 ports for 10BASE-T connection. Each port supports up to 4096 node addresses.

This SuperSwitch also features two high-speed network interfaces that can be adapted using optional SuperSwitch Modules to 100BASE-TX (TX), 100BASE-FX (FO), 100BASE-FX over single-mode fiber (SFO), or extended-distance 100BASE-FX over single-mode fiber (SXFO).

SuperSwitch 16 and SuperSwitch 24

The SuperSwitch 16 provides 16 switched Ethernet ports and an optional high-speed uplink module. The SuperSwitch 24 has 24 switched Ethernet ports, two dual-speed 10-/100-Mbps UTP ports, and one slot for high-speed uplinks.

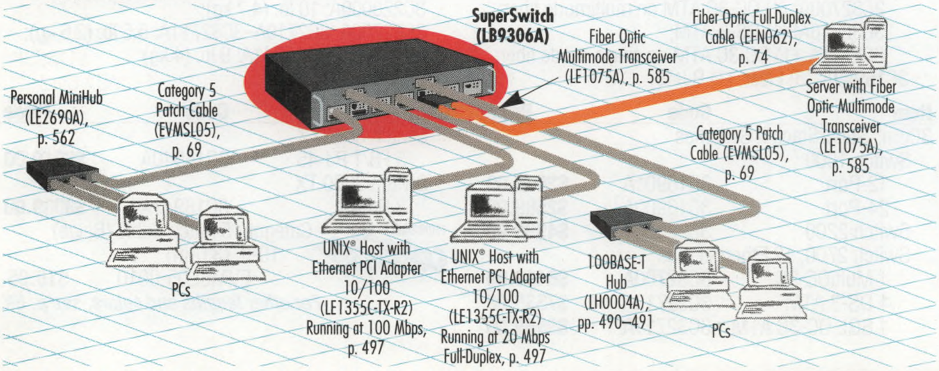
Configure the high-speed uplink modules in half-duplex mode for shared networks or full-duplex for networks running up to 200 Mbps.

Available modules include (2) 10/100 UTP ports; (1) 10/100 UTP and (1) fiber (up to 4 km); and (2) fiber ports (up to 40 km).

The dual 100BASE-FX modules support up to 100 Mbps and the other modules support half-to full-duplex up to 200 Mbps.

SPECIFICATIONS

Duplex Support — Half and full
Speed — 10/100 Mbps
Uplink — SuperSwitch 6/13: Modular: (2) 100BASE-TX or -FX;
SuperSwitch 16/24: Modular: Single- or Dual-Port Modules available for 100BASE-TX or FX
CE Approval — All items listed are approved
Connectors — LB9306A: (6) 10-Mbps AUI or 10-Mbps RJ-45;
LB9313A: (6) 10-Mbps AUI, (13) 10-Mbps RJ-45;
LB9316A: (16) RJ-45;
LB9324A: (24) RJ-45;
All: (1) DB9 Console
Power — LB9306A, LB9313A: 115–230 VAC, 50–60 Hz autosensing;
LB9316A, LB9324A: 100–240 VAC, 50–60 Hz, 40 W
Size — LB9306A: 2.5"H x 17.3"W x 14"D (6.4 x 43.9 x 35.6 cm);
LB9313A: 3.4"H x 17.3"W x 14"D (8.6 x 43.9 x 35.6 cm);
LB9316A, LB9324A: 2.6"H x 17.3"W x 13"D (6.5 x 44 x 33 cm)
Weight — LB9306A, LB9313A: 16 lb. (7.5 kg);
LB9316A, LB9324A: 8 lb. (3.6 kg)


SuperSwitch (LB9306A)
Fiber Optic Multimode Transceiver (LE1075A), p. 585
Fiber Optic Full-Duplex Cable (EFN062), p. 74
Server with Fiber Optic Multimode Transceiver (LE1075A), p. 585
Personal MiniHub (LE2690A), p. 562
Category 5 Patch Cable (EVMSL05), p. 69
Category 5 Patch Cable (EVMSL05), p. 69
PCs
UNIX® Host with Ethernet PCI Adapter 10/100 (LE1355C-TX-R2) Running at 100 Mbps, p. 497
UNIX® Host with Ethernet PCI Adapter 10/100 (LE1355C-TX-R2) Running at 20 Mbps Full-Duplex, p. 497
100BASE-T Hub (LH0004A), pp. 490–491
PCs

FAXBACK INFORMATION
For SuperSwitch 6/13: 15224
For SuperSwitch 16/24: 19101
Call 412-746-5500 Anytime

Item	Code	Price
SuperSwitch 6	LB9306A	**$3995.00**
with 100BASE-TX Module Installed	LB9306A-TX	**$4495.00**
SuperSwitch 13	LB9313A	**$6995.00**
with 100BASE-TX Module Installed	LB9313A-TX	**$7495.00**
SuperSwitch 6/13 Modules		
TX (100BASE-TX)	LB9310-TX	**$1295.00**
FO (100BASE-FX)	LB9310-FO	**$1495.00**
SFO (100BASE-FX, Single-Mode Fiber)	LB9310-SFO	**$1795.00**
SXFO (100BASE-FX Extended-Distance Single-Mode Fiber)	LB9310-SXFO	**$2495.00**
SuperSwitch 16	LB9316A	**$2795.00**
w/Dual 10/100 Module	LB9316A-TX	**$3195.00**
SuperSwitch 24	LB9324A	**$3995.00**
SuperSwitch 16/24 Modules		
Dual-Port 10/100 UTP	LB9320A-TX	**$1195.00**
10/100 UTP/100BASE-FX		
for Multimode Fiber	LB9320A-TX/FX	**$1345.00**
for Single-Mode Fiber up to 18 km	LB9320A-TX/SMFX	**$1755.00**
for Single-Mode Fiber up to 40 km	LB9320A-TX/SOFX	**$1955.00**
Dual Port 100BASE-FX		
for Multimode Fiber	LB9320A-FX	**$1575.00**
for Single-Mode Fiber up to 18 km	LB9320A-SMFX	**$2055.00**
for Single-Mode Fiber up to 40 km	LB9320A-SOFX	**$2285.00**
remember to order cables Category 5 Patch Cables (Beige) (RJ-45), 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For other applications and lengths, see pp. 68–69, 74 and 118.

10/100 Mbps Mbps Modular Up to 16 Ports

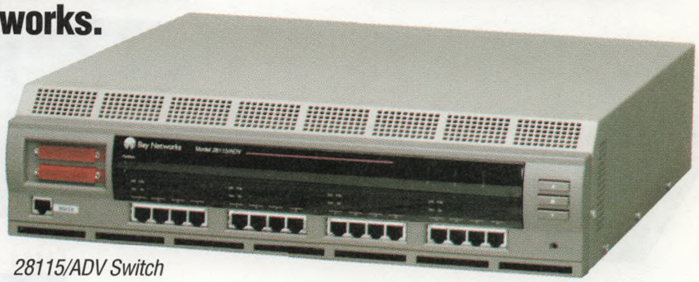
100 Mbps Modular Up to 16 Ports

BayStack Ethernet Switches

Powerful Desktop Switching Solutions for High-Performance Networks.

Bay Networks

high-speed



28115/ADV Switch

- **Store-and-forward and cut-through switching engines.**
- **Supports RMON, SNMP, and Telnet™ management.**
- **Stackable.**
- **Dedicated 10-Mbps switch ports eliminate network collisions and permit simultaneous data transfers.**

BayStack Ethernet Switches from Black Box work with both 10- and 100-Mbps networks—so you get the flexibility and adaptability to run them at the same time.

The 28104/ADV model offers eight SC-type ports to support 100-Mbps connections over multimode 62.5-/125-µm fiberoptic cable.

The 28115/ADV model has 16 RJ-45 modular ports for 10- and 100-Mbps transmissions over UTP. Two front-panel 50-pin D connector expansion interfaces make direct, full-duplex connections to other switches at 200 Mbps.

SPECIFICATIONS

Duplex Support — Half and full
Speed — 10/100 autosensing
CE Approval — All items listed are approved
Connectors — 28104R: (8) SC-type for 100-Mbps transmissions; 28115R: (16) RJ-45 for 10- and 100-Mbps transmissions, (2) front-panel 50-pin D;
Power — 28104R, 28115R: 115–230 VAC, 200 watts maximum
Size — 28104R, 28115R: 4.2"H x 17.2"W x 18"D (10.5 x 43.7 x 45.7 cm)
Weight — 28104R, 28115R: 26 lb. (11.7 kg)

FAXBACK INFORMATION
Request Document Number: 17563
Call 412-746-5500 Anytime

Item	**Code**	**Price**
BayStack Ethernet Switches		
28104/ADV	28104R	**$14,659.00**
28115/ADV	28115R	**$10,999.00**
remember to order cables Category 5 Patch Cable (Beige) (RJ-45), 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		
Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
For specific applications or bulk cable, see pp. 74 and 118.		

• • • • • • • •

MORE! Bay Networks™ Solutions, **see pp. 483, 493, 519, 554, 563.**

10 Mbps Modular Up to 32 Ports

10/100 Mbps Mbps Modular Up to 26 Ports

100 Mbps Modular Up to 8 Ports

BayStack 28200 Modular Ethernet Switch

Modular High-Speed Switching Means Flexibility for Your Network.

Bay Networks

high-speed

- **Store-and-forward and cut-through switching engines.**
- **Supports RMON, SNMP, and Telnet management.**
- **Stack up to seven switches.**
- **Internal 2-Gbps switching fabric guarantees wire-speed performance for all 10- and 100-Mbps switched connections.**
- **Four front-panel media-dependent adapter (MDA) slots hold any combination of 10- and 100-Mbps Ethernet modules.**

The 28200 Series provides dedicated 10-Mbps switched connections for individual hubs or multiple segments within one hub for peak bandwidth performance. 100-Mbps interfaces provide connections to high-utilization devices—relieving bottlenecks that affect multiple shared 10-Mbps links on your network.

Configure individual connections to operate in half- or full-duplex mode and to implement flow control for 100-Mbps full-duplex operation.

SPECIFICATIONS

Duplex Support — Half and full
Speed — 10/100
Uplink — 4 completely modular slots
CE Approval — All items listed are approved
Connectors — AQ2012002: (8) RJ-45; AQ2012003: (4) ST®-type fiber; AQ2012004: (2) RJ-45; AQ2012005: (2) duplex SC-type fiber
Power — 115–230 VAC, 50–60 Hz, 275 watts maximum
Size — AQ2012001: 5.3"H x 17.3"W x 17"D (13.3 x 43.8 x 43.1 cm); AQ2012002–AQ2012005, AQ2012007: 1.8"H x 6.5"W x 10"D (4.4 x 16.5 x 25.4 cm)
Weight — AQ2012001: 19.7 lb. (8.9 kg); AQ2012002–AQ2012005, AQ2012007: 1.6 lb. (0.7 kg)

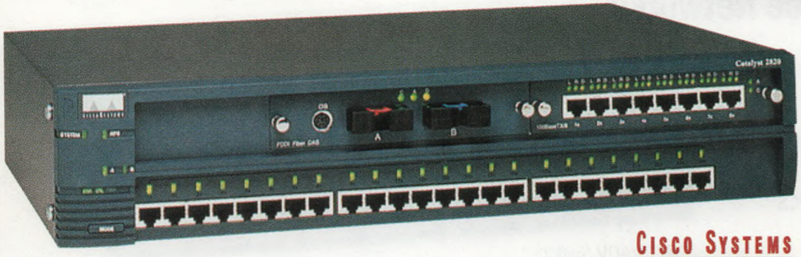
FAXBACK INFORMATION
Request Document Number: 17563
Call 412-746-5500 Anytime

Item	**Code**	**Price**
BayStack 28200 Modular Ethernet Switch		
Four-Slot Chassis	AQ2012001	**$2629.00**
Media Adapters		
28200-15 (8)-Port 10BASE-T MDA Card	AQ2012002	**$2189.00**
28200-14 (4)-Port 10BASE-FL MDA Card	AQ2012003	**$2629.00**
28200-105 (2)-Port 100BASE-TX MDA Card	AQ2012004	**$1739.00**
28200-104 (2)-Port 100BASE-FX MDA Card	AQ2012005	**$2399.00**
28200-109 FDDI MM DAS MDA Card	AQ2012007	**$5999.00**
remember to order cables Category 5 Patch Cable (Beige) (RJ-45), 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		
Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
For specific applications or bulk cable, see pp. 74 and 118.		

10/100 Mbps Mbps **Modular** Up to 25 Ports

Cisco Catalyst 2000 Switch

High-Speed, Low-Cost Switching for Mixed-Media Networks.



FAXBACK INFORMATION
Request Document Number: 18454
Call 412-746-5500 Anytime

CISCO SYSTEMS PARTNER PREMIER RESELLER PENNSYLVANIA

- Store-and-forward and cut-through switching engine.
- Supports RMON, SNMP, and Telnet™ management.
- Use the 25 10BASE-T ports to deliver 10 Mbps of bandwidth to workstations or hubs for bandwidth-intensive applications.
- Two high-speed expansion slots offer high-speed configuration and backbone flexibility.
- CollisionFree® full-duplex operation on 100BASE-T port provides 200 Mbps of bandwidth to servers and between switches.
- ClearChannel™ architecture supports wire-speed bridging and up to 320-Mbps maximum forwarding bandwidth for optimal performance.

SPECIFICATIONS

Duplex Support — Full-duplex on 100-Mbps port
Speed — 10/100
Uplink — Modular: (2) 10BASE-T, 100BASE-T, 100BASE-FX, or FDDI
CE Approval — All items listed are approved
Connectors — (24) RJ-45, plus (1) RJ-45 and (1) AUI
Power — 90–250 VAC, 50–60 Hz
Size — 5.3"H x 19"W x 12.3"D (13.3 x 48.3 x 31.2 cm)
Weight — 23 lb. (10.4 kg)

Item	Code	Price
Cisco Catalyst 2000 Switches		
2820 24 10BASE-T, Two Slots		
2K MAC	WS-C2822	**$3395.00**
8K MAC	WS-C2828	**$4595.00**
100BASE-TX Modules		
1-Port	WS-X2811	**$1195.00**
8-Port	WS-X2818	**$2495.00**
100BASE-FX Modules		
1-Port	WS-X2821	**$1195.00**
4-Port	WS-X2824	**$2995.00**
FDDI Modules		
UTP SAS	WS-X2831	**$3995.00**
Fiber SAS	WS-X2841	**$4295.00**
Fiber DAS	WS-X2842	**$4995.00**
remember to order cables Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

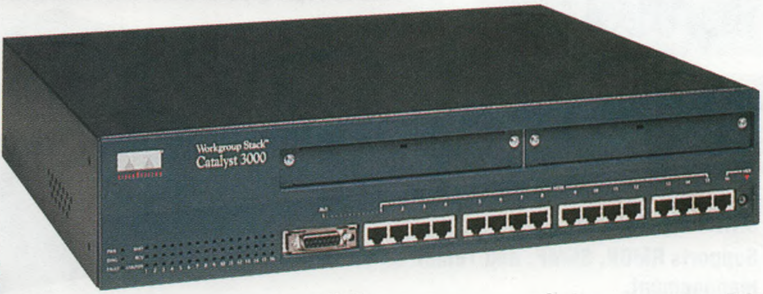
For other lengths and colors, see p. 69.

10/100 Mbps Mbps **Modular** Up to 16 Ports

Cisco Catalyst 3000 Switch

Stack 'em and Support up to 192 Ethernet or 16 Fast Ethernet Interfaces.

MORE! Cisco Products **pp. 508, 513, 516–517, 522, 534–535, 553.**



CISCO SYSTEMS PARTNER PREMIER RESELLER PENNSYLVANIA

- Store-and-forward and cut-through switching engine.
- Supports RMON, SNMP, and Telnet management.
- Stack up to eight base models and support up to 192 Ethernet or 16 Fast Ethernet interfaces.
- Full wire-speed performance.
- Choose from 10BASE-T/FL and 100BASE-TX/FX media types.
- Fully manageable using CiscoWorks™ management tools.
- Two optional module links per device provide extra interfaces for low- or high-speed expansion.

SPECIFICATIONS

Duplex Support — Half and full
Speed — 10/100 Mbps
Uplink — Modular: (2) 10BASE-T, 100BASE-T, 100BASE-FX
CE Approval — All items listed are approved
Power — 90–264 VAC, 47–63 Hz
Size — Catalyst 3000 and Matrix: 3.5"H x 17"W x 13.4"D (8.8 x 43 x 34 cm)
Weight — Catalyst 3000: 17 lb. (7.7 kg); Matrix: 14 lb. (6.4 kg)

FAXBACK INFORMATION
Request Document Number: 18461
Call 412-746-5500 Anytime

Item	Code	Price
Cisco Catalyst 3000 Switch		
16-Port	WS-C3016	**$4785.00**
100-Mbps Modules		
1-Port 100BASE-T w/RJ-45 Connector	WS-X3001	**$1295.00**
2-Port 100BASE-F/ISL, MM w/ SC Connector	WS-X3009	**$2995.00**
2-Port 100BASE-T/ISL, UTP w/ RJ-45 Connector	WS-X3010	**$1995.00**
10-Mbps Modules		
4-Port 10BASE-T	WS-X3002	**$995.00**
3-Port 10BASE-F	WS-X3003	**$1695.00**
1-Port 10BASE-F	WS-X3005	**$1695.00**
Catalyst 3000 Stack Port Module	WS-X3004	**$995.00**
Catalyst Matrix	WS-C3020	**$3500.00**
Catalyst Matrix Redundant Component	WS-X3021	**$3000.00**
remember to order cables Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

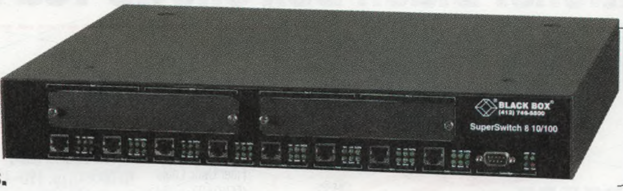
For other lengths and colors, see p. 69.

10/100 Mbps Mbps **Modular** Up to 10 Ports

100 Mbps **Modular** Up to 10 Ports

SuperSwitch 8 10/100

Invest in Black Box's First Autosensing 10/100 Ethernet Switch!



- **Store-and-forward switching engine.**
- **Supports RMON and SNMP management.**
- **Offers eight RJ-45 10/100BASE-T ports.**
- **Two high-speed uplinks for 100BASE-TX, 100BASE-FX, ATM, or Gigabit Ethernet modules.**
- **Interlink 10- and 100-Mbps hubs, and 10/100 workgroup switches and Ethernet segments.**
- **Selective flow control prevents packet loss over half- and full-duplex links.**

With eight RJ-45 ports and two dual high-speed interface slots, this Switch guarantees peak network performance, lower per-port costs, and enhanced reliability.

Use the two expansion slots for twisted-pair, fiber, and ATM uplinks. You can configure every port for half- or full-duplex operation. In full-duplex mode, you can support high-end workstations at speeds up to 200 Mbps. Since full-duplex eliminates collision-domain distance limitations, you can transmit data at distances up to 110 km with one fiberoptic expansion port.

high-speed

SPECIFICATIONS

Duplex Support — Half and full

Speed — 10/100 autosensing

Uplink — Modular: (2) 100BASE-TX, 100BASE-FX, ATM or Gigabit Ethernet

CE Approval — All items listed are approved

Connectors — (8) 10/100BASE-T RJ-45, (1) DB9, (1) SC for single- or multimode

Indicators — Diagnostics: RCV, XMT, LINK, MGMT, CLSN, FC/FD; Management: SNMP, MGMT, PWR, FAULT

Power — 90–260 VAC, 50–60 Hz

Size — 2.5"H x 17.3"W x 14"D (6.4 x 44 x 35.6 cm)

Weight — 12 lb. (5.4 kg)

FAXBACK INFORMATION
Request Document Number: 19118
Call 412-746-5500 Anytime

Item	Code	Price
SuperSwitch 8 10/100	LB9330A	**$6150.00**
w/Two-Port 100BASE-TX Module	LB9330A-TX	**$6250.00**
SuperSwitch 8 Modules		
Two-Port 100BASE-TX	LB9331A-TX	**$1890.00**
Two-Port 100BASE-FX for Multimode Fiber	LB9331A-2FX	**$2290.00**
for Single-Mode Fiber up to 18 km	LB9331A-2SMFX	**$2985.00**
for Single-Mode Fiber up to 40 km	LB9331A-2SOFX	**$3325.00**
One-Port 100BASE-FX for Multimode Fiber	LB9331A-FX	**$2290.00**
for Single-Mode Fiber up to 18 km	LB9331A-SMFX	**$2985.00**
for Single-Mode Fiber up to 40 km	LB9331A-SOFX	**$3325.00**
One-Port ATM w/LAN Emulation	LB9331A-ATM	**$2795.00**
One-Port Gigabit Ethernet for Multimode Fiber up to 450 m	LB9331A-GB	**$3495.00**
for Single-Mode Fiber up to 6 km	LB9331A-SMGB	**$3745.00**
for Single-Mode Fiber up to 20 km	LB9331A-SOGB	**$4995.00**

remember to order **cables**

Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
20-ft. (6.1-m)	EVMSL05-0020	**$14.95**

For other lengths and colors, see p. 69.

Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific applications or bulk cable, see pp. 74 and 118.

◆ ◆ ◆

100 Mbps **Modular** Up to 5 Ports

Fast Ethernet Switch

Get up to 700-Mbps Throughput for Your 100BASE-T Network.

100-Mbps Fast Ethernet
BLACK BOX
(412) 746-5500
Fast Ethernet Switch

- **Store-and-forward switching engine.**
- **Supports RMON and SNMP management.**
- **Direct-transfer architecture from source port to destination port.**
- **Five switched 100BASE-TX or FX ports for 100-Mbps connections, plus two high-speed expansion slots.**

With the Fast Ethernet Switch, you can increase network speed and distance, expand your network without disturbing users, interlink other Fast Ethernet Switches, or drive high-bandwidth application servers. The Switch increases the bandwidth of your 100-Mbps applications by segmenting your network and insulating each segment from the local traffic of other segments.

Combine this Switch with the SuperSwitch (**page 484**) and any 100-Mbps Hub for an enterprise-wide network. Merge the new Fast Ethernet segments with existing 10-Mbps Ethernet LANs—without disturbing users or resources.

Run up to 200-Mbps point-to-point connections over standard cabling in full-duplex mode. Get 100 meters from the 100BASE-TX module, up to 2 km with the FO module, up to 20 km with the SFO module, and up to 40 km with the SXFO module.

high-speed

SPECIFICATIONS

Duplex Support — Half and full

Speed — 100 Mbps

Uplink — Modular: (2) 100BASE-TX or 100BASE-FX

CE Approval — All items listed are approved

Connectors — LB9307A-TX: (5) 100BASE-TX RJ-45 ports; LB9307A-FO: (5) ST® for single-mode and multimode; Both: (2) 100BASE-TX/FX Fiber, (1) DB9 male

Power — 115–230 VAC, 50–60 Hz, autosensing

Size — 2.5"H x 17.3"W x 14"D (6.4 x 43.9 x 35.6 cm)

FAXBACK INFORMATION
Request Document Number: 15901
Call 412-746-5500 Anytime

Item	Code	Price
Fast Ethernet Switch-TX	LB9307A	**$6995.00**
Fast Ethernet Switch-FX New	LB9307A-FO	**$8995.00**
Fast Ethernet Switch Modules		
TX (100BASE-TX)	LB9311-TX	**$1295.00**
FO (100BASE-FX)	LB9311-FO	**$1495.00**
SFO (100BASE-FX, Single-Mode Fiber)	LB9311-SFO	**$1795.00**
SXFO (100BASE-FX, Extended-Distance, Single-Mode Fiber)	LB9311-SXFO	**$2495.00**

remember to order **cables**

Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

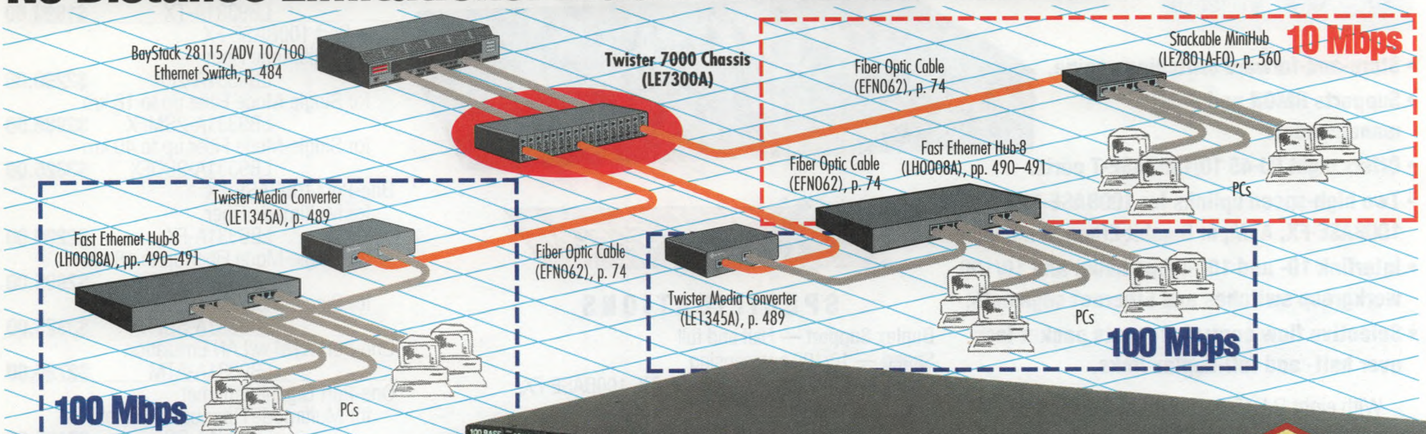
For other lengths and colors, see p. 69.

Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific applications or bulk cable, see pp. 74 and 118.

The Twister 7000 Series

Mix and Match 10 and 100 Mbps with Virtually No Distance Limitations. Black Box Shows You How.


BayStack 28115/ADV 10/100 Ethernet Switch, p. 484
Twister 7000 Chassis (LE7300A)
Fiber Optic Cable (EFN062), p. 74
Stackable MiniHub (LE2801A-FO), p. 560
10 Mbps
Fiber Optic Cable (EFN062), p. 74
Fast Ethernet Hub-8 (LH0008A), pp. 490–491
PCs
Twister Media Converter (LE1345A), p. 489
Fast Ethernet Hub-8 (LH0008A), pp. 490–491
Fiber Optic Cable (EFN062), p. 74
Twister Media Converter (LE1345A), p. 489
PCs
100 Mbps
100 Mbps
PCs

New
100BASE-T
Fiber
10BASE-T
BNC
10BASE-T
Fiber
high-speed

- **Automatically operates in either half- or full-duplex.**
- **Rackmountable modular chassis for 10- and 100-Mbps modules.**
- **Works perfectly with switches and routers from Bay Networks®, Cabletron, Cisco, 3Com®, and Intel®.**
- **Available with single or dual power supply for fully redundant operation.**
- **Accommodates up to 17 modules for both 10- and 100-Mbps Ethernet.**
- **Lowest delay of any 100-Mbps device on the market—only 15 bit times.**

Extend your Ethernet networks by using the long-distance capabilities of fiberoptic cable. With the Twister 7000 Series, you can mix 10BASE-T and 100BASE-T modules in a single convenient chassis *and* stretch your network up to 9.3 miles (15 km).

The Twister 7000 Series is easy to use—no hardware or software setup is required. Simply connect the Twister to the appropriate media. The modules provide minimum repeater delay and are totally transparent to normal network operations. And you can use the small rackmountable chassis to integrate and convert existing network segments—without losing your valuable workspace.

10 BASE
PWR
LK
RX
TX
100 BASE
PWR
LK
RX
TX
100 BASE
PWR
LK
RX
TX

LE7314C LH7414C LH7415C

SPECIFICATIONS

Data Rate — 10-Mbps Module: 10 Mbps (half-duplex), 20 Mbps (full-duplex); 100-Mbps Module: 100 Mbps (half-duplex), 200 Mbps (full-duplex)

CE Approval — All items listed are approved

Connectors — 8-pin RJ-45; multimode or single-mode fiberoptic ST® or SC connector; BNC with selectable 50-ohm terminator

Indicators — Twisted-pair fiberoptic: power and link; Twisted-pair BNC: power, link, and collision

Power — 150 watts maximum; 115–230 VAC, 50–60 Hz, internal autosensing

Size — Interface Module: 3.5"H x 1"W x 4.6"D (8.9 x 2.5 x 11.7 cm); Chassis: 3.5"H x 17"W x 11.3"D (8.9 x 43.2 x 28.7 cm)

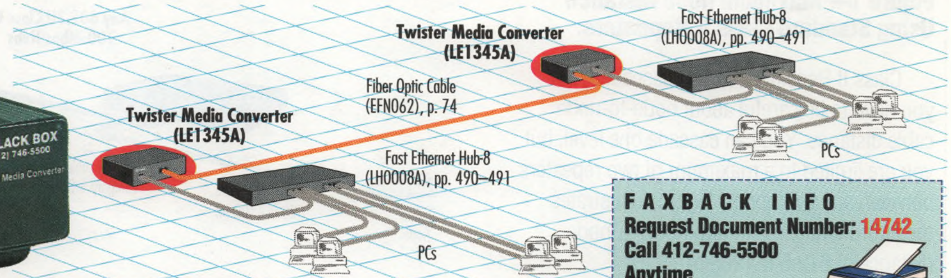
FAXBACK INFORMATION
Request Document Number: 17374
Call 412-746-5500 Anytime

Item	Code	Price
Twister 7000 Chassis		
17-Slot Chassis (Single Power Supply)	LE7300A	**$469.00**
17-Slot Chassis (Dual Power Supply)	LE7300A-PS	**$759.00**
10-Mbps Modules		
10BASE-T/BNC	LE7313C	**$189.00**
10BASE-T/Fiber-ST (Multimode)	LE7314C	**$269.00**
10BASE-T/Fiber-ST (Single-Mode)	LE7316C	**$819.00**
100-Mbps Modules		
100BASE-T/Fiber-SC (Multimode)	LH7414C	**$659.00**
100BASE-T/Fiber-ST (Multimode)	LH7415C	**$659.00**
100BASE-T/Fiber-SC (Single-Mode)	LH7416C	**$2199.00**
Blank Panel	LE7301A	**$24.00**
remember to order cables Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		
Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
For specific lengths or bulk cable, see pp. 74 and 118.		

Twister Media Converters

Inexpensive Conversion from 100BASE-TX to 100BASE-FX.

100BASE-T
Fiber
BLACK BOX
(412) 746-5500
100Base T/F Media Converter
100BASE-FX
LINK
RX
100BASE-TX
LINK
RX
POWER


Twister Media Converter (LE1345A)
Fast Ethernet Hub-8 (LH0008A), pp. 490–491
Fiber Optic Cable (EFN062), p. 74
Twister Media Converter (LE1345A)
Fast Ethernet Hub-8 (LH0008A), pp. 490–491
PCs
PCs

FAXBACK INFO
Request Document Number: 14742
Call 412-746-5500
Anytime

high-speed

- **Transparent conversion between 100BASE-TX (UTP) and FX (fiberoptic).**
- **Automatically operates in either full- or half-duplex (200- or 100-Mbps).**
- **Lowest latency available—only 15 bit times!**
- **Supports lengths up to 1.2 miles (2 km) on multimode fiber, 9.3 miles (15 km) on single-mode.**
- **Includes autosensing 110/220-VAC 50/60-Hz power supply.**

Twister Media Converters support the reliable, transparent integration of twisted-pair and fiberoptic Fast Ethernet segments. Twister fully restores signals generated from both mediums, so distance limits aren't affected. And since all signal activity is transmitted, reliable, accurate communication and collision detection (half-duplex only) is guaranteed for all connected segments.

Twister is fully interoperable with Fast Ethernet TX and FX hubs and adapters from many of today's top manufacturers, including 3Com®, Cisco, Bay Networks™, CrossCom, SMC®, and **Black Box**!

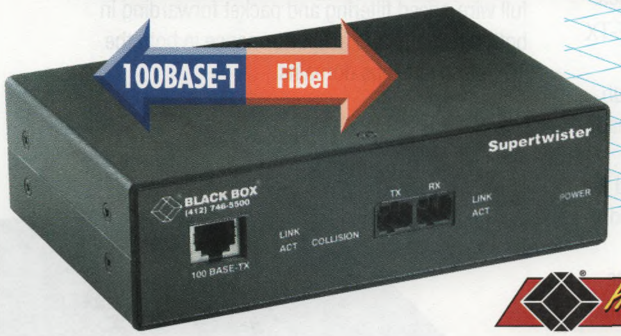
SPECIFICATIONS

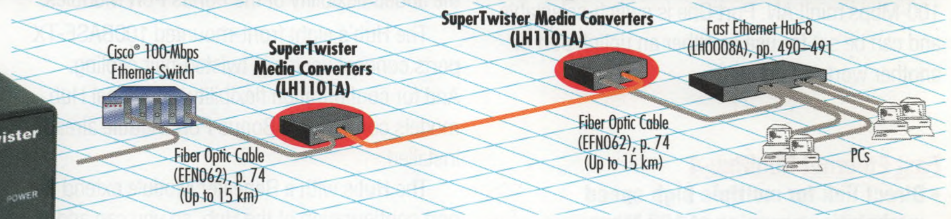
Speed — 100 Mbps half-duplex
CE Approval — All items listed are approved
Connectors — TX: (1) RJ-45 for Category 5 UTP; FX: (1) set multimode duplex ST/SC; (1) set single-mode duplex ST
Indicators — Power, Link, and Receive
Size — 1.8"H x 6"W x 4"D (4.6 x 15.2 x 10.2 cm)
Weight — 3 lb. (1.4 kg)

Item	Code	Price
Twister Media Converters		
Multimode with SC Connectors	LE1345A-R2	**$845.00**
with ST Connectors	LE1345A-ST-R2	**$845.00**
Single-mode with SC Connectors	LE1346A-R2	**$2199.00**
remember to order cables Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
	For other lengths and colors, see p. 69.	
Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
	For specific applications lengths or bulk cable, see pp. 74 and 118.	

SuperTwister Media Converters

Powerful, Compact 100-Mbps Half- to Full-Duplex Conversion.


100BASE-T
Fiber
Supertwister
BLACK BOX
(412) 746-5500
100 BASE-TX
LINK
ACT
COLLISION
TX
RX
LINK
ACT
POWER


Cisco® 100-Mbps Ethernet Switch
SuperTwister Media Converters (LH1101A)
Fiber Optic Cable (EFN062), p. 74 (Up to 15 km)
SuperTwister Media Converters (LH1101A)
Fast Ethernet Hub-8 (LH0008A), pp. 490–491
Fiber Optic Cable (EFN062), p. 74 (Up to 15 km)
PCs

high-speed

- **Enables translation between half-duplex 100BASE-TX and full-duplex 100BASE-FX—automatically!**
- **Uses a 1-MB memory buffer which stores packets to ensure reliable, collision-free data conversion.**
- **Supports up to 1.2 miles (2 km) over multimode fiber or up to 9.3 miles (15 km) over single-mode fiber.**
- **Enables deployment of 100 Mbps in campus or metropolitan areas.**

The SuperTwister half-duplex to full-duplex converter is a cost-effective solution for expanding Fast Ethernet networks. It includes a 1-MB memory buffer which stores packets, ensuring reliable, collision-free data conversion for local workgroups.

FAXBACK INFO
Request Document Number: 16816
Call 412-746-5500
Anytime

SPECIFICATIONS

Speed — 100 Mbps half- and full-duplex
CE Approval — All items listed are approved
Connectors — LH1100A-SC: (1) Set multimode SC; LH1100A: (1) Set multimode ST®; LH1101A: (1) Set single-mode SC
Indicators — Power, Link, Receive, Collision, Error
Power — 110–220 VAC, 50–60 Hz, external autosensing power supply
Size — 1.8"H x 6"W x 4"D (4.6 x 15.2 x 10.2 cm)
Weight — 3 lb. (1.4 kg)

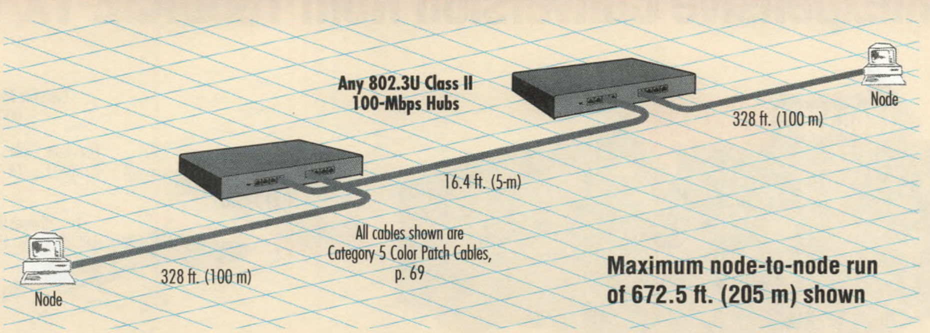
Item	Code	Price
SuperTwister Media Converters		
Multimode with SC Connectors	LH1100A-SC	**$990.00**
with ST Connectors	LH1100A	**$990.00**
Single-Mode with SC Connectors	LH1101A	**$2250.00**
remember to order cables Category 5 Patch Cable 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
	For other lengths, see p. 69.	
Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
	For specific lengths or bulk cable, see pp. 74 and 118.	

Black Box Explains...

Class II and II+ Repeaters.

Figure 1—Maximum Node Distance Using Standard Class II Repeaters.

Class II Repeaters can be cascaded, but you have to be careful about node-to-node cable distance. You can cascade one level, but you are limited to a maximum of two repeaters between any two nodes. Figure 1 illustrates the approximate maximum node-to-node distance of 672.5 ft. (205 m).


Any 802.3U Class II 100-Mbps Hubs
Node
328 ft. (100 m)
16.4 ft. (5-m)
All cables shown are Category 5 Color Patch Cables, p. 69
Node
328 ft. (100 m)
Maximum node-to-node run of 672.5 ft. (205 m) shown

Fast Ethernet Hubs

All the Options You Need to Introduce 100-Mbps

Flexible, fast, and fully compatible with all applicable Ethernet standards and all 10- and 100-Mbps Ethernet products—that's how we describe our Fast Ethernet Hubs. These compact, easy-to-use Hubs have the features *you* need to bring your network up to speed.

IEEE 802.3u is the fast-growing new standard for fast networking—with data rates *10 times higher* than standard Ethernet. And with support for multiple workstations, these new Hubs present the perfect opportunity to pick up the pace of your LAN and bring Fast Ethernet right to your desktop.

Attach a Hub to a high-speed network to support a super-fast workgroup. Or use one in standalone mode to run a self-contained 100-Mbps miniLAN. Port One is switch-selectable and can be set for use as either an uplink port or another workstation port.

Fast Ethernet MiniHub-4

- **Direct link for multiple high-speed workstations running at 100 Mbps.**
- **Switchable uplink port. Link workgroups to Fast Ethernet LANs or support 100-Mbps standalone clusters.**
- **Cascadable, too. Interlink multiple Hubs to support expanding high-speed workgroups.**

The MiniHub-4 is completely compatible with all 100BASE-TX-certified equipment—switches, interface cards, transceivers—so it'll integrate seamlessly with your existing Fast Ethernet hardware, or work in an all-new network.

This compact unit is specially designed to present a low profile, offering extra convenience and simplicity for desktop applications. It complies with 100-Mbps Fast Ethernet standards: IEEE 802.3u with Class II repeater functionality.

Fast Ethernet Hub-8 and Bonus Port Modules

- **Hub offers eight 100BASE-TX RJ-45 ports, including one uplink switch on Port One.**
- **Bonus Port Modules equipped with 100BASE-TX and -FX Repeater ports, and 10BASE-T and 100BASE-FX Switched ports.**
- **Cascade units—without crossover cables—to connect multiple workgroups of more than eight users.**

Here's *everything* you need to connect your power users with servers, test and evaluation systems, and small high-performance network segments in one package—only from Black Box. Get all the features of the Fast Ethernet Hub-8 **plus** the added flexibility of the Bonus Port Modules.

The Hub's eight front-mounted 100BASE-TX ports connect users via twisted-pair cabling. And for configuration flexibility, additional Hub models come with a Bonus Port Module already installed.

The Hubs with a Repeater Module extend the port configuration of the Hub, so you can add a 100BASE-TX or 100BASE-FX device.

The other two Hub Modules transform the Hub into a switching solution. Use the Switched 10BASE-T Module to connect to an existing 10BASE-T network—without buying a new box! Or use the Switched 100BASE-TX Module to connect to another 100-Mbps network.

Fast Personal MiniHub-5 Plus

- **Offers five 100-Mbps user ports with one 10-/100-Mbps switched port.**
- **Plug-and-play installation so you can easily integrate 100-Mbps ports within your network.**
- **High-capacity buffering on switched port helps control data flow.**
- **Extend your 100-Mbps domain to the maximum distances allowed.**

Five 100-Mbps ports, one 10-/100-Mbps switched port! The Fast Personal MiniHub-5 Plus is perfect for incorporating high-speed power users into an existing 10-Mbps LAN.

If one domain operates at 10 Mbps, you'll get full wire-speed filtering and packet forwarding in both directions *and* full performance in both the 10- and 100-Mbps domains.

New
BLACK BOX
Fast Personal MiniHub-5 Plus
PWR
UP LINK
COL
LINK
RX
Mb/s
10
100

Fast Personal MiniHub-5 Plus: Use the switched port to select 10- or 100-Mbps, depending on your application.

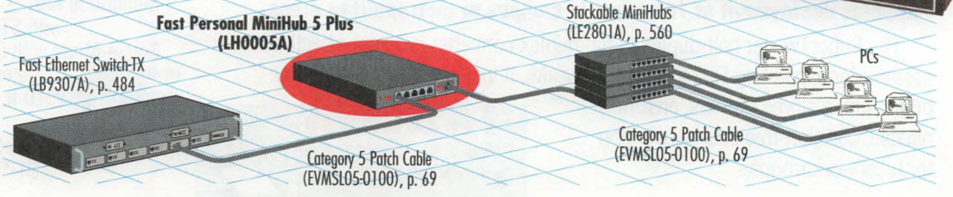
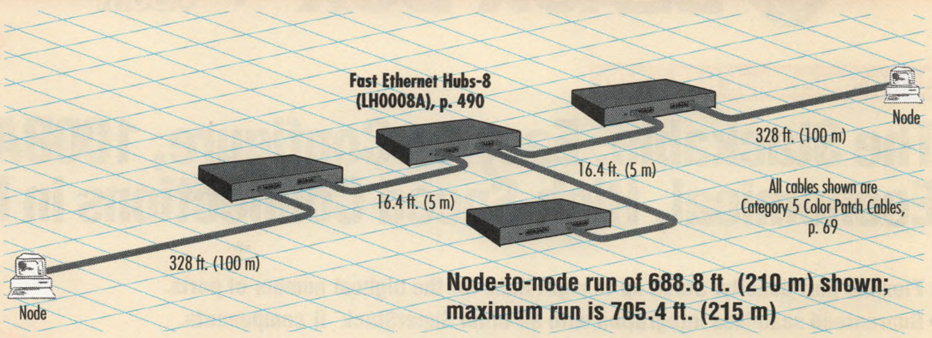

Fast Personal MiniHub 5 Plus (LH0005A)
Fast Ethernet Switch-TX (LB9307A), p. 484
Stackable MiniHubs (LE2801A), p. 560
PCs
Category 5 Patch Cable (EVMSL05-0100), p. 69
Category 5 Patch Cable (EVMSL05-0100), p. 69

Figure 2—Cascading BLACK BOX® Class II+ Repeaters Improves Installation Flexibility.

Class II+ Repeaters enable you to cascade more units and build "tree" structures. The maximum Category 5 cable distance between nodes cannot exceed 705.4 ft. (215 m).

Because you can cascade more levles, Class II+ Repeaters give you greater flexibility in network expansion, as shown in Figure 2. You can even have a node-to-node link with 328-ft. (100-m) connections between node Hubs and a central Hub.


Fast Ethernet Hubs-8 (LH0008A), p. 490
Node
328 ft. (100 m)
16.4 ft. (5 m)
16.4 ft. (5 m)
328 ft. (100 m)
Node
All cables shown are Category 5 Color Patch Cables, p. 69
Node-to-node run of 688.8 ft. (210 m) shown; maximum run is 705.4 ft. (215 m)

Networking Easily and Affordably.

Fast Personal MiniHub-4
BLACK BOX
UPLINK
PWR COL
1 2 3 4
LINK
RX
BLACK BOX
Fast Ethernet Hub
UPLINK
PWR COL
1 2 3 4
LINK
RX
5 6 7 8
LINK
RX

Top: LH0004A
Bottom: LH0008A

If a domain operates at 100 Mbps, Port One's switched port segments the network to reset the repeater hop counts and extend the 100-Mbps domain to the maximum distances allowed.

Use Port One's uplink switch to cascade one Hub to another—without a crossover cable—and incorporate the MiniHub into your network. It automatically learns the addresses of all attached nodes, so you don't have to reconfigure your entire network.

FAXBACK INFORMATION
Request Document Number: 16050
Call 412-746-5500 Anytime

Item	Code	Price
Fast Personal MiniHub-4	LH0004A	**$895.00**
New Fast Personal MiniHub-5 Plus	LH0005A	**$1095.00**
Fast Ethernet Hub-8	LH0008A	**$1195.00**
New Fast Ethernet Hub-8 with Bonus Port Modules		
100BASE-TX Repeater Module	LH0008A-TX	**$1295.00**
100BASE-FX (ST) Repeater Module	LH0008A-FST	**$1395.00**
Switched 10BASE-T Module	LH0008A-S10T	**$1695.00**
Switched 100BASE-TX Module	LH0008A-STX	**$1945.00**
remember to order cables Category 5 Patch Cable, Beige		
10-ft.(3.0-m)	EVMSL05-0010	**$10.95**
15-ft.(4.6-m)	EVMSL05-0015	**$11.95**
25-ft. (7.6-m)	EVMSL05-0025	**$16.95**
50-ft. (15.2-m)	EVMSL05-0050	**$22.95**
100-ft. (30.5-m)	EVMSL05-0100	**$36.95**

For other lengths and colors, please see p. 69.

SPECIFICATIONS

Speed — LE0004A: 100 Mbps;
LH0005A, LH0008A: 10 or 100 Mbps
Standards — LH0004A: IEEE 802.3u (100BASE-T);
LH0005A: IEEE 802.3 10BASE-T, IEEE 802.3u (100BASE-T);
LH0008A: IEEE 802.3 (10BASE-T), IEEE 802.3 u (100BASE-T4, 100BASE-T, 100BASE-FX)
CE Approval — All items listed are approved except LH0005A
Connectors — LH0004A, LH0008A:
Network: (1) RJ-45;
User Ports: (4) or (8) RJ-45;
LH0005A: (6) RJ-45;
All others: (8) 100BASE-TX plus:
LH0008A-TX: (1) TX RJ-45;
LH0008A-FST: (1) Multimode Fiber ST®;
LH0008A-S10T: (1) 10-Mbps RJ-45;
LH0008A-STX: (1) TX RJ-45
Indicators — Chassis LEDs: PWR, COL;
Per Port LEDs: LINK, RX
Power — LH0004A, LH0008A: 115–230 VAC, 50–60 Hz, autosensing;
LH0005A: 100–240 VAC, 47–63 Hz, 20 watts max.;
All others: 90–260 VAC, 47–63 Hz, 40 watts max.
Size — LH0004A: 1.3"H x 6"W x 9"D (3.3 x 15.2 x 22.9 cm);
LH0005A: 1.3"H x 6.1"W x 9.1"D (3.3 x 15.5 x 23.1 cm);
All others: 1.8"H x 17"W x 9"D (4.6 x 43.2 x 22.9 cm)
Weight — LH0004A: 1.6 lb. (0.7 kg);
LH0005A: 1.8 lb. (0.8 kg);
All others: 3.2 lb. (1.5 kg)

BLACK BOX® + 3Com® = the best!

3Com SuperStack II Hub 100

The Stackable, Easy-to-Configure, 100BASE-T Hub for Economical, High-Speed Connections in Departmental LANs.

- **Flexible port density: Stack up to eight Hubs for the highest number of ports.**
- **Guaranteed seamless integration with all other SuperStack™ II components.**
- **Optional Management Unit delivers full SNMP capability.**
- **With 3Com® Transcend applications, you can administer hub ports *and* adapters.**

MORE! 3Com Products pp. 486, 494, 496, 509–510, 512, 537–538, 561, 564–565, 570, 581.

The SuperStack™ II Hub 100 family of network hubs combines the performance advantages of 100-Mbps Fast Ethernet technology with the cost-effectiveness, convenience, and easy manageability of a stackable hub platform.

You can use these scalable Hubs to increase port density, enhance system reliability, and add SNMP management while keeping your initial Fast Ethernet investment low. You also get the flexibility of the 3Com® SuperStack™ II architecture, so you can use your SuperStack™ Hub 100s along with your other SuperStack™ II devices in a single managed stack.

100% Compatible with *All* 3Com SuperStack II and OfficeConnect Products.

Plug these Hubs into any SuperStack™ II or OfficeConnect hardware for a TOTAL 3Com solution. What's more, you can get all 3Com products you need from your number one source for connectivity—Black Box, of course.

MORE! OfficeConnect Solutions, see pp. 561 and 581.

high-speed

3Com® *from* BLACK BOX

Service and Support—without the Wait.

What good is a tech support line if you can't get through, or if the so-called tech on the other end can't help you? At Black Box, our experts are trained to support every 3Com product we carry, so you're guaranteed to get the help you need. And since you'll talk to a live tech within 3–5 rings of placing your call, you'll have the service and support you need—without the wait.

FAXBACK INFORMATION
Request Document Number: 17673
Call 412-746-5500 Anytime

SPECIFICATIONS

Management — Transcend applications, featuring SuperStack View, support this product in Windows® and UNIX® environments

Media Interfaces — 100BASE-TX, 100BASE-FX, or 100BASE-T4

Optional Module Types — Management; transceiver interfaces for 100BASE-TX, 100BASE-FX; redundant power, uninterruptible power, and -48 VDC

Ports Per Unit — (12) RJ-45

Total Number of Units in Stack — Up to eight units operating as one stack

CE Approval — All items listed are approved

Item	Code	Price
SuperStack II Hub 100		
100BASE-TX	3C250A-TX/1	**$1649.00**
100BASE-T4	3C250-T4	**$1599.00**
Transceiver Modules		
100BASE-TX	3C252-TX	**$279.00**
100BASE-FX	3C262-FX	**$399.00**
SuperStack II Hub 100 Management Unit	3C215A	**$1299.00**
Replacement Extension Cable	3C219	**$79.00**

remember to order cables

Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

Duplex Fiber Optic Cable, PVC ST-ST®	EFN062-CC	**$79.95 + $.70/ft.**

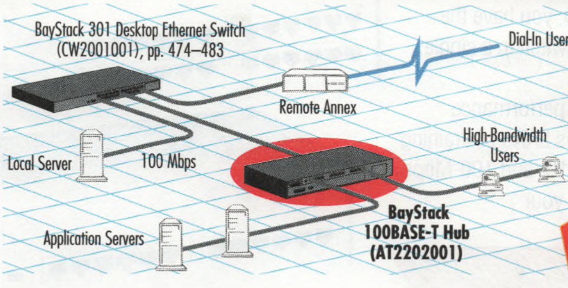
For specific lengths or bulk cable, see pp. 74 and 118.

BayStack 100BASE-T Stackable Hubs

Take the Next Logical Step for Improving Ethernet Performance—Speed Up to 100 Mbps.

- **Full 100-Mbps throughput reduces bottlenecks and increases response time.**
- **Use the media adapter slot to connect other Fast Ethernet devices or attach to end stations or users with fiber cabling.**
- **Install a Network Management Module in the expansion slot and control one hub—or the entire stack—from one station.**

AT2202001


BayStack 301 Desktop Ethernet Switch (CW2001001), pp. 474–483
Dial-In Users
Remote Annex
High-Bandwidth Users
Local Server
100 Mbps
Application Servers
BayStack 100BASE-T Hub (AT2202001)

MORE! Bay Networks Solutions, see pp. 484, 519, 554, 563.

Use the 100BASE-T Stackable Hub for smooth transition to 100BASE-T—and a tenfold increase in bandwidth.

Use a single Hub to support up to 12 users, and the Host Module to expand to 24 users. Stack up to six Hubs and create a collision domain that supports up to 144 users.

The Hubs also include built-in expansion slots for support of a variety of host, network management, and 100-Mbps modules for configuration flexibility.

FAXBACK INFORMATION
Request Document Number: 17549
Call 412-746-5500 Anytime

SPECIFICATIONS

Standards — IEEE802.3u, 100BASE-T

CE Approval — All items listed are approved

Connectors — AT2202001, AT2204001: (12) RJ-45; AT2219001: (1) SC-type multimode

Indicators — LEDs: Hub, Expansion Slot, Media Adapter, Redundant Power Supply, Port Connectivity, Link, Partition, Collision, Bar Graph

Power — 115–230 VAC, 50–60 Hz, 160 watts

Size — AT2202001: 2.6"H x 17.2"W x 11.2"D (6.5 x 43.8 x 28.4 cm);
AT2204001, AT2207001: 1"H x 12"W x 9.6"D (2.5 x 30.5 x 24.3 cm);
AT2219001: 0.8"H x 1.9"W x 3.7"D (2 x 4.8 x 9.5 cm)

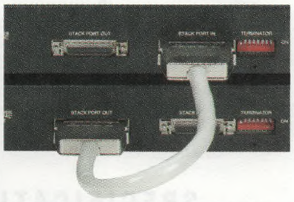
Weight — AT2202001: 10 lb. (4.5 kg) with fiber installed, 12.3 lb. (5.6 kg) with NMM and Media Adapter installed;
AT2204001: 2.4 lb. (1.1 kg);
AT2219001: 0.1 lb. (< 0.1 kg);
AT2207001: 1.8 lb. (0.8 kg)

Item	Code	Price
BayStack 100BASE-T Stackable Hubs		
12-Port	AT2202001	**$1599.00**
12-Port Host Module	AT2204001	**$1449.00**
Fiber Media Adapter	AT2219001	**$369.00**
Network Management Module	AT2207001	**$1459.00**
Cascade Cable	AT0018001	**$89.00**
remember to order cables Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		
Duplex Fiber Optic Cable, PVC ST-ST®	EFN062-CC	**$79.95 + $.70/ft.**
For specific lengths or bulk cable, see pp. 74 and 118.		

◆ ◆ ◆

Stackable Fast Ethernet Hubs

Now Mix TX and FX Media in One Chassis—without Additional Conversion Devices—So You Save Money!



Interconnect up to five Hubs with Stacking Cables. Once linked, the entire stack operates as one unit.

- With the LH0012A-FXSC and -FXST models, both 100BASE-TX and FX can reside in one chassis—so you don't need a media converter. You save a Hub port for connections to other workgroups, reduce the possible points of failure along your transmission line—and save money.
- Given the Hub's built-in conversion capabilities, you only need to use one port on your switch.
- Connect a series of 10/100 switches and their workgroups to a LH0012A-FX that functions as a collapsed backbone—and use the FX port as a longer-range server/bridge connection. Each switch isolates and filters activity from the Hub backbone and the other workgroups to reduce bottlenecks and improve overall performance.
- Use these stackable, mixed-media Hubs to maximize your per-switch port investment.

FAXBACK INFORMATION
Request Document Number: 16809
Call 412-746-5500 Anytime

SPECIFICATIONS

Standards — IEEE 802.3

Connectors — All: (1) 40-pin MII, (12) RJ-45; LH0012A-SC: (1) SC; LH0012A-ST: (1) ST®

Indicators — LEDs: (1) PWR, (1) COL, (1) TX/RX, (1) Partition per port, (1) Link Activity per port

Power — 115–230 VAC, autosensing

Size — 1.8"H x 17.5"W x 12"D (4.6 x 44.5 x 30.5 cm)

Weight — 9 lb. (4 kg)

Item	Code	Price
Stackable Fast Ethernet Hubs		
12-Port 100BASE-TX	LH0012A	**$1995.00**
plus (1) 100BASE FX-SC Port	LH0012A-FXSC	**$2195.00**
plus (1) 100BASE FX-ST Port	LH0012A-FXST	**$2195.00**
Stacking Cable	LH0012-CBL	**$95.00**
remember to order cables Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		
Duplex Fiber Optic Cable, PVC ST-ST®	EFN062-CC	**$79.95 + $.70/ft.**
For specific lengths or bulk cable, see pp. 74 and 118.		

3Com SuperStack II Dual-Speed Hub 12- and 24-Port

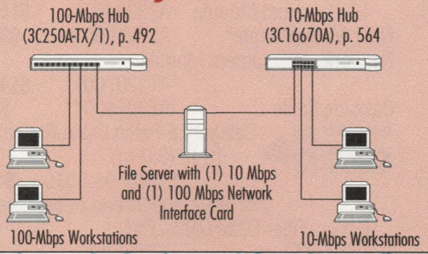
One-of-a-Kind Technology—the Perfect Hub Solution.

- **10-/100-Mbps hub, and 10/100 switch functionality—in one convenient box.**
- **Migrate to 100 Mbps while maintaining compatibility with 10-Mbps devices.**
- **Automatically detects speed of attached devices and channels data accordingly.**
- **Choose 12- or 24-Port model.**

With the SuperStack II Dual-Speed Hub, you have the power and flexibility of two hubs and one switch in a single, convenient, cost-effective unit.

You can introduce high-speed network performance without disrupting activity on your 10-Mbps LANs or draining workgroup bandwidth. And that means all 10- and 100-Mbps users can exist on one workgroup and use your existing network equipment.

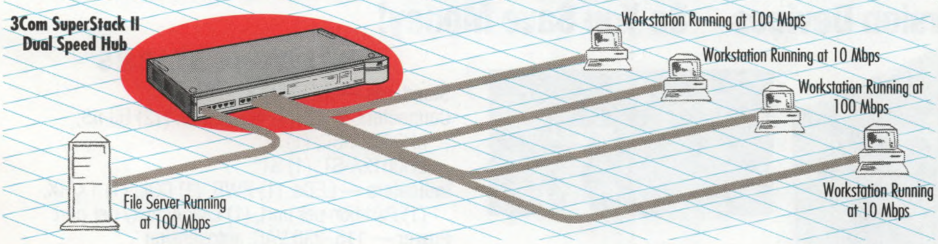
The Old Way...


100-Mbps Hub
(3C250A-TX/1), p. 492
10-Mbps Hub
(3C16670A), p. 564
File Server with (1) 10 Mbps and (1) 100 Mbps Network Interface Card
100-Mbps Workstations
10-Mbps Workstations

In the past, users who needed 10- and 100-Mbps functionality had to configure their file server with both 10- and 100-Mbps NICs. Plus you needed 10- and 100-Mbps hubs to connect to workstations operating in both network environments.

The New Way...

Now configure your file server at 100 Mbps. All users connected to the 3Com SuperStack II Dual Speed Hub can operate at 10 or 100 Mbps—the Hub automatically detects the speed of attached devices and channels data to the appropriate backplane segments.


3Com SuperStack II
Dual Speed Hub
Workstation Running at 100 Mbps
Workstation Running at 10 Mbps
Workstation Running at 100 Mbps
Workstation Running at 10 Mbps
File Server Running at 100 Mbps

3Com® from BLACK BOX

Need Help? Give Our Techs a Call.

Unsure about Dual-Speed Architecture? Or what 3Com products will suit your needs? No problem—our techs are here to help. And they'll help you faster than any other technical support group—so fast you'll speak with a tech within 20 seconds of placing your call. So you'll have the answers—and the products—you need before you know it.

SPECIFICATIONS

Standards — IEEE 802.3u 100BASE-T
CE Approval — All items listed are approved
Connectors — 3C16590: (12) RJ-45;
3C16591: (24) RJ-45
Indicators — Unit LEDs: PWR, COL/ACT;
Port LEDs: PART, LINK, 100M segment
Power — Both models: 100–120/200–240 VAC, 47–63 Hz
3C16590: 84 W;
3C16591: 130 W
Size — 2.6"H x 19"W x 12.2"D (6.6 x 48.3 x 31 cm)
Weight — 3C16590: 10.1 lb. (4.6 kg);
3C16591: 11 lb. (5 kg)

FAXBACK INFORMATION
Request Document Number: 18980
Call 412-746-5500 Anytime

3Com®

Black Box Explains...

What's Special about Dual-Speed Architecture?

With dual-speed architecture, each hub port automatically senses the speed of attached devices. An internal switch segments traffic to and from each device based on speed, so you don't have to worry about interruptions to your network's performance.

The SuperStack II Dual-Speed Hub is ideal for offices with mixed 10-/100-Mbps workgroups, and for migrating from 10 to 100 Mbps. Now you can upgrade slowly rather than buy one hub for 10 Mbps and another for 100 Mbps.

Plus, everything you need is in one box so you can save valuable workspace while keeping future expansion options open.

Item	Code	Price
3Com SuperStack II Dual-Speed Hub		
12-Port	3C16590	**$1379.00**
24-Port	3C16591	**$2099.00**
remember to order cables Category 5 Patch Cable (Beige) (RJ-45 to RJ-45)		
10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
20-ft. (6.1-m)	EVMSL05-0020	**$14.95**

For other lengths and colors, see p. 69.

Intel® Express 10/100 Stackable Hubs

The Flexible Transition to Fast Ethernet—in a Single Managed Stack.

New
Intel Express
10/100 Stackable Hub
intel.

Intel Express 10/100 Stackable Hubs are available in a 12-Port version (above) that features a pair of expansion slots for specialized modules, and a 24-Port version for maximizing the number of managed ports in a stack.

- **Combine 10- *and* 100-Mbps Ethernet in a single managed stack.**
- **Configure each Hub for either 10- or 100-Mbps operation according to your network requirements.**
- **Expand the capabilities of the 12-Port Hub with optional management, fiber, or Ethernet Modules.**
- **Use the Cascade Cable to stack up to eight units for a maximum of 180 managed or 192 unmanaged ports.**
- **Integrates fully with all other SuperStack products.**

intel. *from* BLACK BOX

Your network's down. And your boss wants the problem fixed—now. But without a purchase order number no one will even talk to you… Plus, it's 4:55 P.M. and your vendor's tech support line shuts down at 5:00. What can you do?

For one thing, next time buy from Black Box. Our Tech Support is FREE every time you call, not matter when or how may times you call.

What's more, our experts are available all day, every day, to assist you—and the only number you need to know is **412-746-5500**.

Optional Modules for the 12-Port Hub:

- **SNMP**—For adding SNMP management to your stack.
- **Ethernet**—For connecting 100-Mbps segments to 10-Mbps segments, or for extending collision domains.
- **100BASE-FX**—Use fiberoptic cable to connect up to 2 km away.

Intel Express 10/100 Stackable Hubs provide an easy and cost-effective transition to Fast Ethernet. Now, instead of buying a 10-Mbps hub today, and a 100-Mbps hub later, this Hub meets your current and future expansion requirements.

With Intel Express 10/100 Stackable Hubs, you configure each Hub to operate at either 10 or 100 Mbps according to the needs of your network. When you upgrade a workgroup to 100-Mbps Ethernet, just reconfigure its Hub. You run 100 Mbps when and where you need it while still running 10 Mbps on other parts of your network.

You can stack up to eight units for a maximum of 180 managed or 192 unmanaged ports. And that means this Hub will integrate completely with your small LAN or your large, fully-managed network.

The flexible 12-Port Hub features two expansion slots for optional modules listed in the box **below**. The 24-Port Hub maximizes the number of managed ports in a stack.

The Management Module has an easy-to-read LCD display making it simple to set up and manage your Hub, or stack of Hubs. You can also use this Module to control all 10- and 100-Mbps segments, and to change the Hub to operate at either speed.

With this single, cost-effective solution, you never need to consider a 10-Mbps hub again. What's more you never have to worry about reinstallation, redesigning your entire network, or revisiting your network wiring closet to increase bandwidth to the desktop.

SPECIFICATIONS

Maximum Cabling Distance — Category 5 Cable: 328 ft. (100 meters);
Fiberoptic Cable: 525 ft. (160 meters)
CE Approval — All items listed are approved
Connectors — Both: DB9;
EE110TX12: 12 RJ-45;
EE110TX24: 24 RJ-45
Power — 120/240 VAC, switch-selectable
Size — 8.5"H x 21.5"W x 17.5"D
(21.6 x 54.7 x 44.5 cm)
Weight — 19 lb. (8.6 kg)

FAXBACK INFORMATION
Request Document Number: 19170
Call 412-746-5500 Anytime

Item	Code	Price
Intel Express 10/100 Stackable Hubs		
12-Port	EE110TX12	**$1295.00**
24-Port	EE110TX24	**$1995.00**
Expansion Modules (12-Port Model Only)		
SNMP	EE110MM	**$839.00**
Ethernet	EE110EM	**$499.00**
100BASE-FX	EE110FX	**$839.00**
remember to order cables Intel Cascade Cable	EE110CC	**$70.00**
Category 5 Cables, 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		
Terminated Fiber Optic Cable, ST-ST®,		
SMA905	EFN062-MM	**$95.00 + $.70/ft.**
SMA906	EFN062-BB	**$95.00 + $.70/ft.**

Intel EtherExpress PRO/100 LAN Adapters

High-Speed Adapters Autoshift to 100-Mbps for Maximum Throughput!

- **Autosensing configuration supports 10- or 100-Mbps segments.**
- **PCI cards feature Adaptive Technology for long-term investment protection.**
- **Low CPU utilization yields the highest throughput for today's *fastest* PCs.**

Intel® EtherExpress™ PRO/100 Adapters improve response time by increasing pure-wire throughput and lowering CPU usage, so you get the industry's fastest total system performance.

Lab tests show the PRO/100 Cards have the highest throughput (over 87 Mbps) while only using 30% of the CPU. They're IEEE compatible with a complete driver set (including Windows® 95), have integrated silicon for reliability, and auto-negotiation for running 10 *or* 100 Mbps!

MORE! Intel Solutions, **see pp. 495, 498, 536, 549–552, 568, 580, 599–600.**

FAXBACK INFORMATION
Request Document Number: 17587
Call 412-746-5500 Anytime

They're especially recommended for all new Pentium® processor systems using the PCI bus. Several models are available for PCI, EISA, or ISA bus connections, and 100BASE-TX (Category 5) or 100BASE-T4 (Category 3) cabled networks.

PCI versions feature Adaptive Technology to update hardware via "reloadable microcode." The Smart Adapter has an on-board i960® processor and 2 MBytes of memory to minimize CPU usage.

Intel EtherExpress PRO/100
Smart Adapter
The intelligent, high performance server adapter.
intel

CE Approval — All items listed are approved

Item	Code	Price
Intel EtherExpress PRO/100 LAN Adapters		
100BASE-TX		
PCI Model B	PILA8465B	**$79.95**
PCI (5-Pack)	PILA8465BPAK5	**$379.95**
ISA	PCLA8560	**$169.95**
EISA	EILA8265	**$249.95**
100BASE-T4		
PCI	PILA8475B	**$149.95**
PCI (5-Pack)	PILA8475BPAK5	**$699.95**
PCI Smart Adapter	PILA8485	**$729.95**
Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

remember to order cables

For other lengths and colors, see p. 69.

* * *

3Com Network Interface Cards

3Com NICs—Great Prices. In Stock. All from Black Box.

Fast EtherLink XL Adapters

The XL family of network adapters provides optimized network performance for both Ethernet and Fast Ethernet networks with patented 3Com Parallel Tasking® architecture, PACE™ Interactive Access technology, and DynamicAccess™ features.

Fast EtherLink® 10/100BASE-T Adapter (3C597-TX)

Fast EtherLink 10/100BASE-T Adapters

Supports high-performance, reliable networking at 10 or 100 Mbps for PCI-or EISA-bus machines. 3Com® 10/100 NICs set the industry standard for performance. With their exclusive Parallel Tasking technology, you get top speeds at both 10 and 100 Mbps. Fast EtherLink Cards support 10/100BASE-TX for EISA and ISA buses, and 10/100BASE-T4 (Category 3, 4, and 5 UTP) for your PCI bus computers.

Fast EtherLink 10/100BASE-T Adapter Ready Paks

The Pak comes equipped with a 10-foot (3.0-m) Category 5 Cable (EVMSL05).

MORE! 3Com Products **pp. 486, 492, 494, 509–510, 512, 537–538, 561, 564–565, 570, 581.**

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!

CE Approval — All items listed are approved

FAXBACK INFORMATION
Request Document Number: 17697
Call 412-746-5500 Anytime

Item	Code	Price
Fast EtherLink® Adapters		
XL PCI 10/100 (10/100 Mbps)		
One	3C905-TX	**$139.95**
Five-Pack	3C905-TX-5PK	**$639.95**
XL PCI 10/100 Adapter Ready Pak Includes (**1**) Adapter **plus** (**1**) 10-ft. Category 5 Patch Cable	3C905-TX-CABPAK	**$150.90**
PCI 10/100 T4 (One)	3C905-T4	**$179.95**
EISA 10/100		
One	3C597-TX	**$249.95**
Five-Pack	3C597-TX-5PK	**$1219.95**
Category 5 Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

remember to order cables

For other lengths and colors, see p. 69.

Fast Ethernet TX and FX Adapters

Plug-and-Play 100-Mbps Adapters Ease Installation Headaches!

- Full-duplex 10- or 100-Mbps Ethernet.
- Provides busmaster transfer rates up to 132 MB.
- Minimizes CPU overhead.
- Includes drivers for all major operating systems including Windows®, Windows 95, Windows NT™, OS/2®, SCO®, UNIX®, and more.
- Offers a full complement of diagnostic LEDs.

10-/100-Mbps Autosensing

SPECIFICATIONS

Speed — 10/100 Mbps

CE Approval — All items listed are approved

Interface — 32-bit PCI busmaster, 133-Mbps bandwidth; PCI Plug-and-Play software configuration

Connectors — LE1355C-TX-R2: Autosensing RJ-45;
LE1355C-FX: SC or ST for multimode;
LE1355C-FXST: ST;
LE1355C-SMFX: SC for single-mode

Indicators — LE1355C-TX-R2: (4) LEDs: TX, RX, 10 Mbps, 100 Mbps;
All other models: (3) LEDs: TX, RX, Link

Power — 3.8 W maximum

Size — 4.1"W x 5.2"L (10.4 x 13.2 cm)

FAXBACK INFORMATION
Request Document Number: 14728
Call 412-746-5500 Anytime

Item	Code	Price
Ethernet 10/100 PCI Adapters		
TX	LE1355C-TX-R2	**$199.00**
100BASE-FX Adapters		
FX-SC	LE1355C-FX	**$399.00**
FX-ST	LE1355C-FXST	**$399.00**
SMFX	LE1355C-SMFX	**$1950.00**
remember to order cables Category 5 Patch Cable (Beige)		
10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

NEW LOW PRICE! $

For other lengths and colors, see p. 69.

Item	Code	Price
Duplex Fiber Optic Cable, PVC		
ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

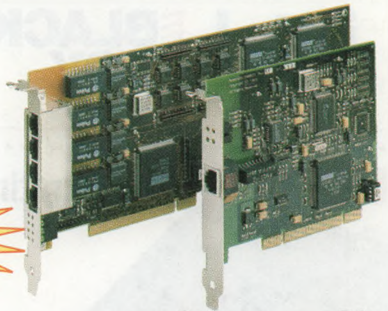
For specific lengths or bulk cable, see pp. 74 and 118.

Fast Ethernet PCI Adapters

Turn Your Servers into Multiport Fast Ethernet Engines!

- Multichannel Adapter supports four 100-Mbps segments in full-duplex—without a repeater.
- 32-bit busmastering design maximizes throughput on PCI machines.
- Single-Port Adapter supports 10BASE-T and 100BASE-TX networks.

10-/100-Mbps



SPECIFICATIONS

Speed — LH0040C: 100 Mbps;
LH0011C: 10/100 Mbps

CE Approval — All items listed are approved

Connectors — LH0040C: (4) RJ-45;
LH0011C: (1) RJ-45

Indicators — LH0040C: (4) Link Integrity, (4) Network Activity;
LH0011C: Collision, Activity, 100 Mbps, Link

Power — From the computer interface

Size — LH0040A: Full-card;
LH0011C: Half-card

FAXBACK INFORMATION
Request Document Number: 16108
Call 412-746-5500 Anytime

Item	Code	Price
100BASE-TX PCI Adapters		
4-Port Multichannel	LH0040C	**$1250.00**
Single Port 10/100	LH0011C	**$249.00**
remember to order cables Category 5 Patch Cable (Beige)		
10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

Fast Ethernet PC Card

This Compact, Go-Anywhere, Fast Ethernet Card Senses and Automatically Adapts to 10- or 100-Mbps Ethernet.

Fast Ethernet PC Card

10- or 100-Mbps Ethernet!
BLACK BOX
(412) 746-5500
FAST ETHERNET
PC CARD

Fast Ethernet PC Card (LH1000A) showing the RJ-45 (10BASE-T/100BASE-TX) connector.

FAXBACK INFORMATION
Request Document Number: 16294
Call 412-746-5500 Anytime

EXCLUSIVE

- A 10BASE-T or 100BASE-TX Adapter—all in a single PC Card.
- Autosenses and switches between 10-or 100-Mbps Ethernet operation.
- One RJ-45 port supports both standards.
- Fits all PCMCIA 2.1, Type II-compliant PCs.

SPECIFICATIONS

Connectors — (1) RJ-45 female

Power — 600 mA (Active)

Size — 0.2"H x 2.1"W x 3.4"D (0.5 x 5.4 x 8.5 cm)

Weight — 0.2 lb. (0.1 kg)

Item	Code	Price
Fast Ethernet PC Card	LH1000A	**$429.00**
remember to order cables Category 5 Patch Cable (Beige)		
10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths or colors, see p. 69.

FAST ETHERNET PC CARD COMPATIBILITY WITH NETWORK OPERATING SYSTEMS

BUYER'S GUIDE

Network Operating Systems	Fast Ethernet PC Card (LH1000A)
Banyan® VINES®	✓
Chameleon® NEWT	✓
DEC™ PATHWORKS®	✓
FTP Lanwatch	✓
FTP PC/TCP®	✓
IBM® LAN Server V	✓
IBM OS/2® LAN Server	✓
IBM PC LAN	✓
LANtastic® X	✓
Microsoft® LAN Manager	✓
Novell® DOS 7	✓
Novell NetWare® 2.x, 3.x, 4.x	✓
Novell NetWare Lite™	✓
OS/2® Warp	✓
PC-NFS®	✓
Windows® 95	✓
Windows for Workgroups	✓
Windows NT™ Server	✓
Windows NT 3.1, 3.5x	✓
Wollongong Pathway	✓
Wollongong WIN/TCP	✓

Intel® NetportExpress™ PRO/100 Print Server

Total Network Printer Control for All Fast Ethernet Printer Connections.

New
intel
NetportExpress PRO/100

- **Support for all major network operating systems and management consoles.**
- **Protects your equipment investment, too, by adding new life to older printers.**
- **One easy-to-use tool for installation and configuration.**

NETWORK COMPUTING EDITOR'S CHOICE

LAN TIMES READERS CHOICE 1995

With the Intel® NetportExpress™ PRO/100 Printer Server, you get full functionality over 100-Mbps Fast Ethernet for your external printer connections. And you don't have to replace your print server every time you replace your printers. The PRO/100 features both parallel and serial ports for support of all makes of printers—including inkjet printers. And setup is easy—just plug it in and print.

CE Approval — All items listed are approved

MORE! Intel® Solutions, see pp. 495–496, 536, 549–552, 568, 580, 599–600.

intel. from BLACK BOX

Why? Warranties & Tech Support.
Intel® Print Servers come with a 3-year hardware warranty. Plus you get Black Box Tech Support, the best in the business, from Intel® trained technicians.

FAXBACK INFORMATION
Request Document Number: 17604
Call 412-746-5500 Anytime

Item	Code	Price
Intel NetportExpress Print Servers		
PRO/100	PCLA2451	**$459.00**
remember to order cables Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

FastJet 10/100

Migrating to Fast Ethernet? Now Route Print Jobs Faster than Ever!

EXCLUSIVE

- **Supports 100-Mbps printing to HP® LaserJet® 4 series, Brother® 1260, and all MIO-compatible printers.**
- **Transparent multiprotocol support offers flexible use for a variety of popular systems.**

Another Black Box First! FastJet 10/100 is the fastest high-speed print server on the market. And it's the perfect solution for those who've upgraded to Fast Ethernet, or who plan to upgrade soon.

With support for 10- or 100-Mbps operation, you can upgrade without swapping interface cards.

And you get multiprotocol support for Novell® NetWare®, UNIX®, OS/2®, LAN Manager/Server, Windows NT™, Windows® for Workgroups, and the Apple® operating system.

SPECIFICATIONS

Protocol — SPX/IPX™, TCP/IP, UDP/IP, NCP/IPX, NetBEUI, EtherTalk®, DLC, LLC
Speed — 180 Kbps, 300 Kbps maximum burst
Interface — Centronics parallel
Connectors — (1) 36-pin female
Power — From the computer interface
Size — Half-card

FAXBACK INFORMATION
Request Document Number: 16067
Call 412-746-5500 Anytime

Item	Code	Price
FastJet 10/100	LH0001A	**$875.00**
You may also need...		
Ethernet PCI Adapter 10/100	LE1355C	**See page 497.**
Ethernet Print Server	LE3802A	**See page 580.**
remember to order cables Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

100BASE-TX,-FX Transceivers

Your Inexpensive Connection to Any 100-Mbps Cable.

- **Connects directly to Fast Ethernet adapters.**
- **Supports 100-Mbps operation over Category 5 or fiberoptic cable.**

Use the 100BASE-TX, -FX Transceivers as an inexpensive solution to seamlessly integrate of 100-Mbps Ethernet adapters, servers, workstations, and other peripherals into your existing twisted-pair LAN segments. Plug the Transceivers directly into the 100-Mbps interface adapter installed in the user PC (DTE) using a 40-pin MII. And the unique "neck" design complies fully with IEEE 802.3u specifications.

SPECIFICATIONS

Speed — 100 Mbps
CE Approval — All items listed are approved
Connectors — Both models: (1) MII 40-pin connector male;
LE1341A: (1) RJ-45;
LE1340A: (1) SC-type fiberoptic connector
Indicators — LEDs: Power, Link, Transmit, Receive, Collision
Power — 750 mA max. at 5 VDC (from DTE)
Size — 0.9"H x 1.9"W x 3.8"D (2.3 x 4.8 x 9.7 cm)
Weight — < 1 lb. (< 0.5 kg)

Item	Code	Price
100BASE-TX Transceiver	LE1341A	**$269.00**
100BASE-FX Transceiver	LE1340A	**$299.00**
remember to order cables Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific lengths or bulk cable, see pp. 74 and 118.

PWR
LINK
TX
RX
COL
BLACK BOX
100Base FX Transceiver
PWR
LINK
TX
RX
COL
BLACK BOX
100Base TX Transceiver

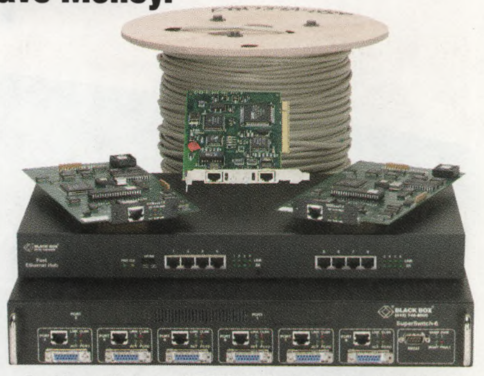
FAXBACK INFORMATION
Request Document Number: 14735
Call 412-746-5500 Anytime

High-Speed Workgroup and Backbone Packages

Integrate to 100 Mbps, Centralize Network Management—And Save Money.

- **Select a Workgroup Package and upgrade to 100 Mbps.**
- **Select a Backbone Package to centralize network management and integrate 100-Mbps into your existing Ethernet network.**
- **Fast Ethernet Hubs offer switchable uplink ports for workgroup or standalone clusters.**
- **Adapter cards run full-duplex 10- or 100-Mbps Ethernet and support drivers for all major operating systems, including Windows®, Windows 95, Windows NT™, OS/2®, SCO™, and UNIX®.**
- **SuperSwitch-6 offers SNMP and Spanning Tree Management, as well as custom filtering for virtual LAN capabilities and security.**

Our High-Speed Workgroup and Backbone Packages give you the high-speed capabilites to upgrade your current Ethernet network. All the equipment you need is in one convenient package so it's virtually impossible to forget something—we've already thought of it. And what's more, these pre-assembled packages are money-savers. We've even calculated your savings over purchasing these parts individually, so it's the perfect solution for upgrading, centralizing network management—and saving money.



Backbone Package (LP0031A) includes (top to bottom): Category 5 Cable, 100BASE-TX Module, Ethernet 10/100 PCI Adapters, Fast Ethernet Hub, and SuperSwitch-6.

THE HIGH-SPEED WORKGROUP/BACKBONE PACKAGES INCLUDE:

Packages	Package Components (Quantity)						
	Super-Switch-6 (LB9306A)	100BASE-TX Module (LB9310-TX)	Fast Ethernet Hub-4 (LH0004A)	Fast Ethernet Hub-8 (LH0008A)	Category 5 Patch Cable (EVMSL05-0020)	Category 5 Solid Bulk 4-Pair Cable (EYN737A-0500)	Ethernet 10/100 PCI Adapters (LE1355C-TX-R2)
High-Speed Workgroup Packages							
4-User (LP0025A)			1		4 Cables		4
5-User (LP0026A)				1	5 Cables		5
High-Speed Backbone Packages							
LP0030A (includes Patch Cable)	1	1		1	10 Cables		
LP0031A (includes Adapters & Bulk Cable)	1	1		1		1 Spool	5

CE Approval — All items listed are approved

FAXBACK INFORMATION
For Workgroup Packages: 16799
For Backbone Packages: 16775
Call 412-746-5500 Anytime

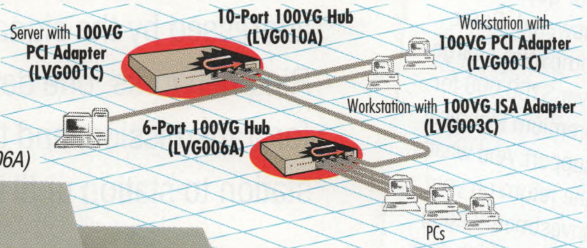
Item	Code	Individual Parts	Package Price	Savings
High-Speed Workgroup Packages				
4-User	LP0025A	**$1757.00**	**$1650.00**	**$107.00**
5-User	LP0026A	**$2672.50**	**$2350.00**	**$322.50**
High-Speed Backbone Packages				
with Patch Cable	LP0030A	**$7050.00**	**$6350.00**	**$700.00**
with Adapters and Bulk Cable	LP0031A	**$7962.00**	**$7150.00**	**$812.00**

◆ ◆ ◆

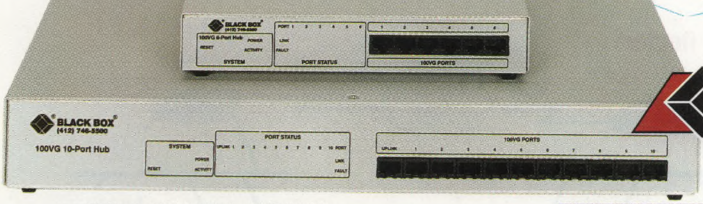
100VG Hubs and Adapter Cards

Prioritize Time-Sensitive Data.

- **The ideal network for data-intensive applications like video and multimedia.**
- **Up to 96-Mbps data throughput.**


Server with 100VG PCI Adapter (LVG001C)
10-Port 100VG Hub (LVG010A)
Workstation with 100VG PCI Adapter (LVG001C)
Workstation with 100VG ISA Adapter (LVG003C)
6-Port 100VG Hub (LVG006A)
PCs

6-Port 100VG Hub (LVG006A)



10-Port 100VG Hub (LVG010A)

Black Box 100VG Hubs support Ethernet or Token Ring frames. They can be cascaded through the uplink port to connect to any other 100VG Hub to up to three levels and up to nearly 1000 nodes.

100VG Adapters plug into your IBM® PC or compatible just like ordinary Ethernet Adapter Cards. Each Card has a connector for 10BASE-T and for 100VG, so you can use the Cards with your 10BASE-T network now and upgrade to 100VG later.

Your existing Category 3, 4, or 5 cabling can be adapted to 100VG. Call Technical Support for details.

FAXBACK INFORMATION
Request Document Number: 15891
Call 412-746-5500 Anytime

SPECIFICATIONS

Operating Systems — NetWare® 3.12 and 4.x, Windows® for Workgroups, and Windows NT™

CE Approval — LVG010A, LVG001C–LVG003C

Connectors — LVG006A: (6) RJ-45; LVG010A: (10) RJ-45; LVG001C–LVG003C: (2) RJ-45 (one Ethernet and one 100VG)

Indicators — LEDs: LVG006A: (6) Link Status, (6) Fault, (1) Power, (1) Activity; LVG010A: (10) Link Status, (10) Fault, (1) Power, (1) Activity; LVG001C–LVG003C: (1) Link Status, (1) Activity

Power — LVG006A: 115-VAC, 60-Hz external supply; LVG010A: 115–260 VAC, 50–60 Hz autosensing; LVG001C–LVG003C: From the interface

Size — LVG006A: 1.3"H x 6"W x 3.4"D (3.3 x 21.3 x 15.2 cm); LVG010A: 2"H x 16.5"W x 8"D (5.1 x 41.9 x 20.3 cm); LVG001C–LVG003C: Half-card

Item	Code	Price
100VG Hubs		
6-Port	LVG006A	**$1300.00**
10-Port	LVG010A	**$2300.00**
100VG Adapters		
PCI	LVG001C	**$280.00**
EISA	LVG002C	**$315.00**
ISA	LVG003C	**$260.00**

remember to order cables

Item	Code	Price
Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

Your Personal Routing Tutorial—

You can use these pages to:

- Become familiar with routers;
- Determine if you need a router;
- Identify common routing applications;
- Find appropriate products to suit your application.

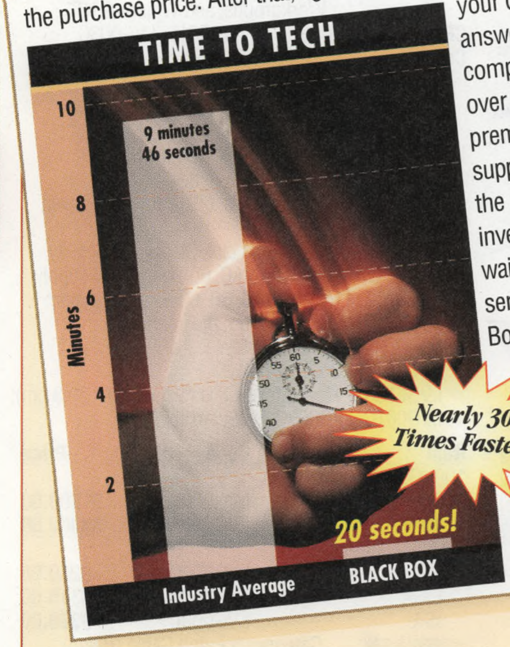
Black Box Explains...

Just How Long Are You Prepared to Wait for Technical Support?

At Black Box, We Think 20 Seconds Is Long Enough.

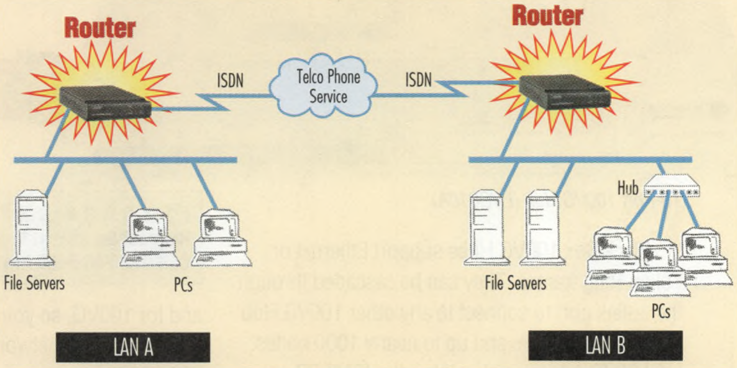
The Best Technical-Service Value in the Industry!

Contracts for basic phone support can start at 20% of the purchase price. After that, figure on $200 per hour to get your questions answered. Some companies charge over $100,000 for premium technical support. And what's the return on your investment? Long waits and high-cost service. But at Black Box, our best advice is FREE—with no long wait. See the Black Box Bottom Line on pages 506–507!



What Is a Router?

A router connects different networks together. Networks are usually classified as either Ethernet—the most common network cable configuration—or Token Ring. In Ethernet networks, one device sends a signal to all connected devices, but only those devices addressed by the signal respond to it. In Token Ring networks, one device sends out a signal for transmission, and this signal is passed from station to station until it reaches its destination.



Only from Black Box.

Do You Need A Router?

A router is used for a variety of applications. If you

- need Internet access;
- have your own home page or Web site on the Internet;
- want to connect your branch offices with corporate headquarters;
- need to provide telecommuters with remote access to corporate sites;
- plan to expand your current network;

you need a router to complete your network.

The Two Most Common Router Uses—

Internet Access..............................see pp. 502–503

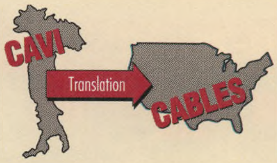
Corporate Branch-Office Connections....see pp. 504–505

90% of all routers are used for one of these two applications.

BLACK BOX® Routers

Turn the page to find out more!

A router performs many functions, including:

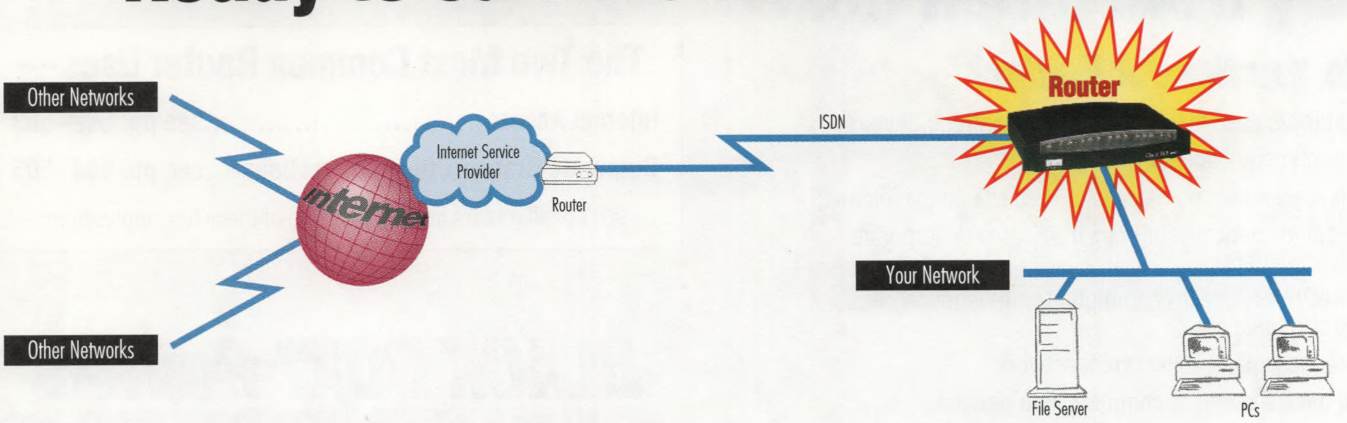


1. Translation between two different networks. If you need to communicate with someone who speaks a language different from yours, you can't do so without someone translating your words into a language the other person can understand. A router functions in much the same way. All networks communicate with attached devices through protocols—the languages that enable this communication to take place. The router receives information from one device, translates it into information the receiving device can understand, and sends it on its way.

2. Security from unwanted users. If you have a group of small networks, you may want to restrict access to certain areas—and a router can do just that. For example, you may need networks A and B to communicate, but you want network C to have no access to network B. Your router isolates network C from network B, but still allows it to function as needed.

3. Navigation through your network. When you plan a trip, you typically use the most direct and efficient route to reach your destination in the least amount of time with the least amount of traffic. A router navigates through the network to find the most efficient way to send and receive information. Once the router receives information from a specific network, it takes the data and places it in the best format for forwarding it to its destination. It also determines the best way to send the information, so the data gets to its destination in the shortest time.

Ready to Surf the Net? Black Box Has a


Other Networks
Other Networks
Internet
Internet Service Provider
Router
ISDN
Router
Your Network
File Server
PCs

With a BLACK BOX® Router in place, you can provide simultaneous Internet access for every user on your network—without a dedicated line for each user. That means each user can send and receive e-mail and do research on the Net. You can also use a router to create your own presence on the Internet by developing a Web site for outside users to access.

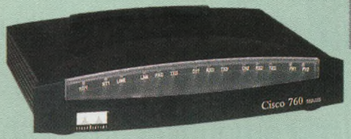
Internet Routers

INTERNET APPLICATIONS

E-Mail & Research

1–10

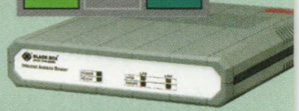
500 Series ISDN Routers
(page 508)



Cisco Series 760 ISDN Routers
(page 508)

11–25

3Com® OfficeConnect® Remote Routers (page 509)



Internet Access Routers
(page 510)

Async Routers
(page 509)

Web Presence

Confused about the Best Router for Your Needs?

Give our Expert Technical Support Staff a call, and they'll point you in the right direction. Plus, they're available 24 hours a day, 7 days a week, so you can reach them whenever *you* need them.

TECH SUPPORT
OUR BEST PRODUCT!

Router for *Every* Internet Application.

Ask These Questions Before Selecting a Router for Your Internet Access Applications:

- How many users are on your network, and how many of them need Internet access?
- Do you have an Ethernet or Token Ring network?
- Are you going to use the Internet to send and receive e-mail and research various topics?
- Are you going to use the Internet to create a presence on the Internet through a Web site or home page?
- What Internet access provider are you going to use?

FEATURES LEGEND

Bridging Capabilities	Modular	All Software Included
Bridging	Modular	Software
Leased PSTN ISDN	IP IPX™ Multiprotocol	PPP LAPB Frame-Relay
Line Type	LAN Protocol	WAN Protocol

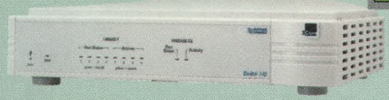
Router Features

For more details, see pages 506–507.

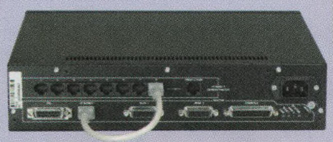
Number of Users

26–100

2000 Series ISDN Office Routers
(page 511)



3Com® OfficeConnect® NETBuilder Routers
(page 510)



Remote Ethernet Hub/Routers
(page 511)

3Com SuperStack™ II Access Builder Remote Access Servers
(page 512)

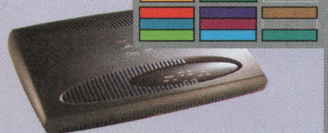
100+

internet
E-Mail & Research or Web Presence

When you see this Internet logo next to a router presentation, you know that these routers are ideally suited for Internet applications—e-mail and research, or creating a presence on the Web. However, they may be appropriate for other applications as well. If you have questions, call Tech Support.

T1 Multiprotocol Router
(page 513)

Remote Bridge/Routers
(pages 514–515)

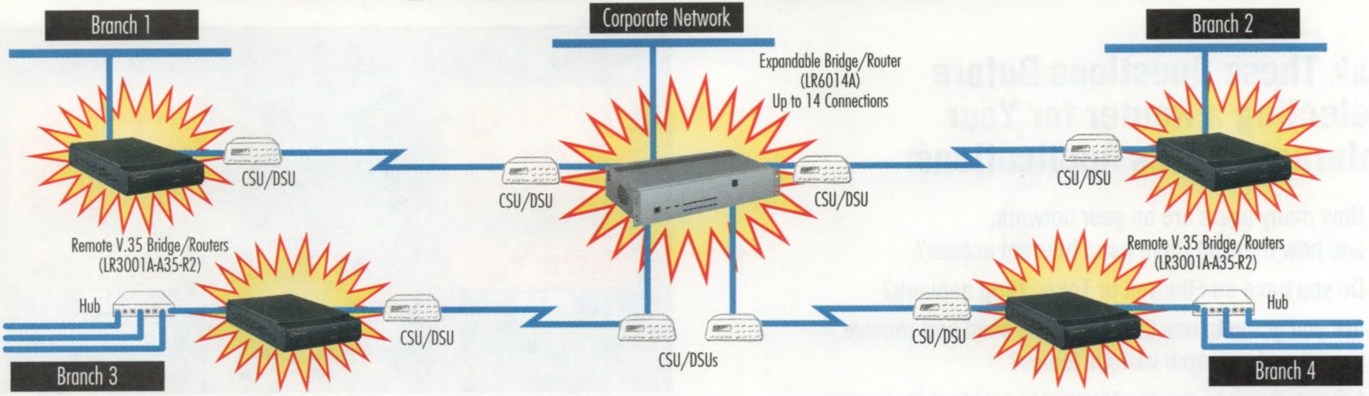


Cisco Series 1600 Modular Routers
(page 513)

Cisco 2500 Family
(pages 516–517)

Remote Token Ring
Local Token Ring
More LAN

Is Your Corporate Network Branching Out?


Branch 1
Corporate Network
Branch 2
Expandable Bridge/Router
(LR6014A)
Up to 14 Connections
CSU/DSU
CSU/DSU
CSU/DSU
CSU/DSU
Remote V.35 Bridge/Routers
(LR3001A-A35-R2)
Remote V.35 Bridge/Routers
(LR3001A-A35-R2)
Hub
Hub
CSU/DSU
CSU/DSUs
CSU/DSU
Branch 3
Branch 4

As your business grows, your corporate network needs to grow, too. And that means your network could benefit from the addition of one or more routers.

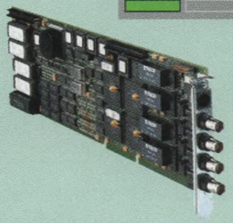
With routers in place, you can keep all your branch offices connected to the corporate headquarters. All connected users can access files and send and receive corporate e-mail—without intruders disrupting performance. Simply put, a router enables you to communicate with everyone connected to your network.

Branch-Office Routers

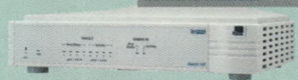
1

2

Ethernet Only



RISC Bridge/Router Cards
(page 518)



3Com® OfficeConnect® NETBuilder Routers
(page 510)

2000 Series ISDN Office Routers
(page 511)

Remote Bridge/Routers
(pages 514–515)

Remote Ethernet Hub/Routers
(page 511)

3Com SuperStack™ II Access Builder Remote Access Servers
(page 512)

Cisco Series 1600 Modular
(page 513)

Ethernet & Token Ring

One Phone Call Does It All: 412-746-5500.

Get it right the first time. Let our techs help you find the exact router to suit your corporate branch-office routing needs. They'll make sure you have everything you need to complete your routing package.

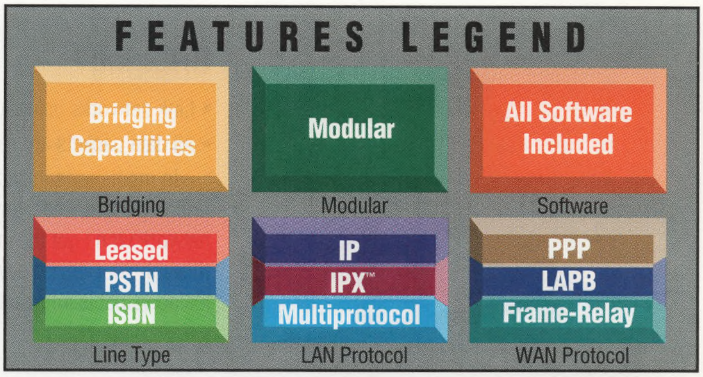
TECH SUPPORT OUR BEST PRODUCT!

The World's Premier Tech Support Service Provider!

Black Box Has the Router You Need.

Ask These Questions Before Selecting a Router for Your Corporate Branch-Office Applications:

- How many branch-office locations do you have?
- How many users are on your entire network?
- What type of network is in place at each location?
- What access method are you planning to use?
- Are you installing a router for the first time on this network, or is another router already in place?
- If you have an existing router:
  - What is it used for?
  - Who is the manufacturer?
  - Do you plan to connect to this existing router or create a new link elsewhere on the network?



FEATURES LEGEND

Bridging	Modular	Software
Bridging Capabilities	Modular	All Software Included

Line Type	LAN Protocol	WAN Protocol
Leased	IP	PPP
PSTN	IPX™	LAPB
ISDN	Multiprotocol	Frame-Relay

Router Features

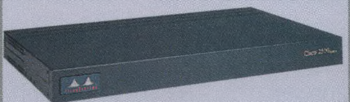
For more details, see pages 506–507.

Number of Remote Sites

Standalone RISC Bridge/Routers
(page 518)

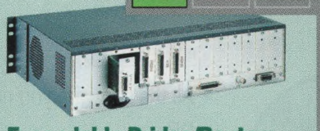
3

T1 Multiprotocol Router
(page 513)



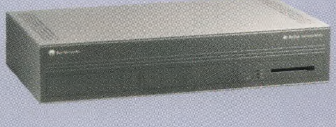
Cisco 2500 Family
(pages 516–517)

4–18



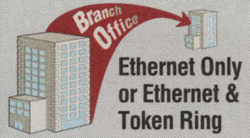
Expandable Bridge/Routers
(page 520)

RISC Bridge/Router Chassis
(page 521)



BayStack Access Nodes
(pages 519)

19–26



Ethernet Only or Ethernet & Token Ring

When you see this logo, you know these routers are suited for branch-office applications. However, they may be appropriate for other applications as well. If you have questions, call Tech Support.

Cisco Series 3600
(page 522)

Remote Token Ring
Local Token Ring
More LAN

Router Features and

Bridging Capabilities

Bridging

- Link networks using any type of standard Ethernet or Token Ring protocol.
- All data packets are received by the attached LANs—no packets are discarded.

In most cases, protocols like DECnet™ and NetBIOS aren't routable. If your router doesn't have bridging capabilities, any packets with these unroutable protocols will be discarded—and the receiving network won't get the information it needs. But with bridging capabilities, all protocols will be passed through your device—whether they are routed or bridged—so you don't have to worry about losing valuable information.

Modular

- Expand your network quickly and easily.
- Configure your router to suit your needs and get the features you want.
- Simply add another module or expansion card to increase capabilities throughout your network.

A modular chassis makes it easy, economical, and convenient to mix different interfaces, cable types, and protocols as you expand your network. Use the built-in expansion slots to meet a variety of WAN and LAN connectivity requirements and keep pace with your busy, constantly changing network sites.

You can save money, too, because you simply add the appropriate modules to get the features you want and support your growing network—without buying a new router.

All Software Included

Software

- All the software you need is installed in the router.

OR

- You choose just the software you need for your application.

Either the router comes with pre-installed software *or* software packs are available that contain additional protocol support, MAC address support, or other features you want in your router.

Why Buy from Black Box?

TECH SUPPORT
OUR BEST PRODUCT!

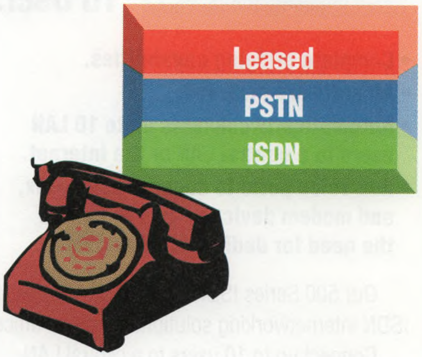
Recognize any of these situations?

- You waited more than 30 minutes to get through to a vendor's tech support.
- The so-called "tech" couldn't help you, or gave you the wrong answer.
- You didn't have a purchase order number and the tech refused to help you.
- It's 9 P.M. and you need help, but your vendor's tech support line is closed.

According to a recent survey by *Data Communications* magazine, 90 percent of network managers say that getting the technical support they need is extremely important when choosing a vendor. But even though network managers pay anywhere from 10 to 20 percent of their overall purchase price for a basic service and support contract, the technical support

What They Mean:

Line Type



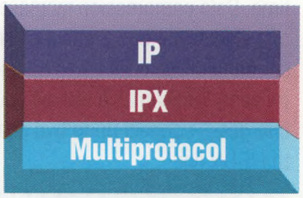
- Indicates the type of communications line you can use to connect remote networks.
- Must support one or all of these LAN lines for your router to function.

A **leased line** is a telephone line reserved for exclusive use by a leasing customer that remains online at all times. You can lease most kinds of lines—56K, Frame Relay, T1, Fractional T1, and Switched 56.

A **PSTN**—Public Switched Telephone Network—provides a dialup-line connection for users. An example is a home telephone line.

ISDN, or Integrated Services Digital Network, is a high-speed digital dialup service. With ISDN, you can transmit large amounts of data, voice, and video signals over a single telephone line—at a lower cost than *any other* digital services.

LAN Protocol

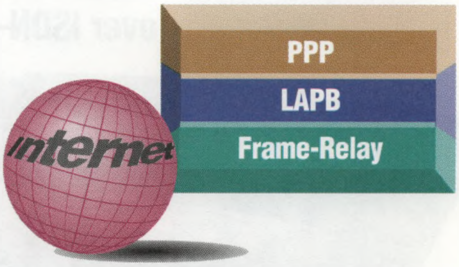


- IP and IPX™ are the most commonly used LAN protocols.
- "Multiprotocol" means your router can support a variety of LAN protocols, including IP, IPX, and AppleTalk®.

IP is typically used in UNIX® or other TCP/IP environments.

IPX is the communications protocol in Novell® NetWare® that creates, maintains, and terminates connections between network devices, such as workstations and servers.

WAN Protocol



- These protocols give routers the support they need to communicate with each other over wide-area links.
- WANs generally link cities or other widely spread local area networks.

PPP (Point-to-Point Protocol) is a commonly used standard protocol for direct communication between two routers over leased-line, PSTN, ISDN, or other WAN links. Because it links routers that otherwise wouldn't be compatible, PPP is often used in Internet applications.

Line Access Procedure, Balanced (LAPB) is also a standard protocol but is not as widely used as PPP.

Frame Relay, a high-speed packet-switching protocol used in wide area networks (WANs), provides leased-line rates from 56K to 1.544 Mbps. Frame Relay is economical because it eliminates the need for multiple leased lines at central sites and reduces hardware costs.

Exceptional Value. Exceptional Tech Support. Period.

and service they receive falls far short of their expectations—and certainly isn't worth the $10,000–$100,000 they paid.

At Black Box, you'll *never* have these experiences. In fact, we guarantee Black Box provides the best value and the best support (see **right**).

Don't waste time and money—call Black Box today!

The Black Box Bottom Line!

	Cost of (3) Cisco 2501 Routers		(3) 1-Year SMARTnet™ Contracts & (3) 1-Year Renewals		Actual Cost of (3) Routers
The Competition:	$5967.00	+	$1650.00*	=	$7617.00
From Black Box:	$6630.00	+	FREE!**	=	$6630.00

*Only Available 9–5—no weekend or holiday service
* Takes up to ONE HOUR to return your call

**Available all day, every day
**Immediate response—calls answered within 3–5 rings
**FREE every time you call, no matter how many times you call

Buy from BLACK BOX and—
✓ Save $987!
✓ Get FREE Technical Support!
✓ No Contracts!

Internet E-Mail & Research
1–10 Users

500 Series ISDN Routers

ISDN Internetworking for up to 10 Users in Your Small Office.

New
BLACK BOX®
(412) 746-5500
ISDN Router
Power
LAN
Link 1
Link 2

ABSOLUTELY GUARANTEED FOR LIFE

- **Complete bridging capabilities.**
- **All software included.**
- **Automatically connects up to 10 LAN users to a central LAN or the Internet.**
- **Add voice ports to connect voice, fax, and modem devices—and eliminate the need for dedicated analog lines.**

Our 500 Series ISDN Routers are *complete* ISDN internetworking solutions for small offices.

Connect up to 10 users to a central LAN or the Internet—and change the users at any time. Data compression increases the capacity of a single 64-Kbps B channel, and protocol spoofing drops calls when no user traffic is present. You can also reduce your analog phone charges—connect up to two analog devices to the ISDN line!

SPECIFICATIONS

Line Type — ISDN
Protocols — LAN: IP, IPX, AppleTalk®
WAN: PPP
CE Approval — All items listed are approved
Size — 1.6"H x 6.1"W x 4.3"D (4 x 15.5 x 11 cm)
Weight — 0.7 lb. (0.3 kg)

FAXBACK INFORMATION
Request Document Number: 19008
Call 412-746-5500 Anytime

Item	Code	Price
500 Series ISDN Routers		
IP with PPP	LR1500A-US	**$695.00**
IP/IPX with PPP, Compression, Spoofing, and NetSAFE	LR1510A-US	**$845.00**
IP/IPX with PPP, Voice, Compression, Spoofing, and NetSAFE	LR1520A-US	**$995.00**
remember to order cables RJ-45 (8-Wire) Modular Cable, 7-ft. (2.1-m) Straight Pinned	EL08MS-07	**$4.95**

For other lengths and pinnings, see p. 71.

◆ ◆ ◆

Internet E-Mail & Research
1–10 Users

Cisco Series 760 ISDN Routers

Support for up to Four Attached Users over ISDN—Expandable to up to 1500!

Cisco Systems
PARTNER
PREMIER RESELLER
PENNSYLVANIA

New
RDY
NT1
LINE
LAN
RXD
TXD
CH1
RXD
TXD
CH2
RXD
TXD
PH1
PH2
Cisco 760 SERIES

- **Complete bridging capabilities.**
- **All software included.**
- **High-speed remote access to the Internet as well as enterprise networks.**
- **Ideal for telecommuters, too.**
- **Analog support saves money—no separate phone lines are needed.**

Support up to four attached devices with the Cisco Series 760 ISDN Routers. They're perfect for small-office voice and data-communications. And with multilink point-to-point protocol (PPP), they're easy to integrate with existing products.

Model 761 connects an Ethernet LAN to ISDN BRI services. Model 762 includes an integrated NT1 device. Model 766 includes two RJ-11 interfaces for use with analog phones, modems, and faxes. These devices can share the same ISDN BRI line—eliminating the need for multiple phone lines or expensive ISDN phones. You can save *even more* because the Routers dial the ISDN line only when it's needed.

Need more MAC addresses? The Remote Office Feature Set can support 1500 addresses!

SPECIFICATIONS

Line Type — ISDN
Protocols — LAN: IP, IPX;
WAN: PPP
CE Approval — CISCO762-US
Indicators — LEDs: RDY, NT1 LINE, LAN, RXD, TXD, CH1
Power — 110-VAC, 60-Hz, external power supply
Size — 1.6"H x 8.3"W x 9.6"D (4.1 x 21.1 x 24.4 cm)
Weight — 1.7 lb. (0.8 kg)

FAXBACK INFORMATION
Request Document Number: 18423
Call 412-746-5500 Anytime

Cisco Systems *from* BLACK BOX

Help without the Wait.

If you buy a Cisco product elsewhere, you'll be charged a large percentage of the product cost just for tech support. And you'll have a long wait—sometimes up to *30 minutes*—before someone actually answers your call. Or your question.

At Black Box you get fast answers at the right price—because our Tech Support is always FREE, every day, every time you call. Why waste your time—or money—going elsewhere? Call Black Box today!

Item	Code	Price
Cisco Series 760 ISDN Routers		
761 Ethernet/ISDN BRI IP/IPX	CISCO761-CH	**$599.00**
762 Ethernet/ISDN NT1 IP/IPX	CISCO762-US	**$649.00**
766 Ethernet/ISDN NT1 IP/IPX W/Two POTS	CISCO766-US	**$799.00**
Remote Office Feature Set	SW760B-US-3.2	**$300.00**
remember to order cables Category 5 Patch Cable, (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

Internet
E-Mail & Research
1–10 Users

3Com® OfficeConnect™ Remote Routers

Compact Components to Simplify Small-Office Network Connections.

3Com®

- **Complete bridging capabilities.**
- **Get high-speed ISDN connections to any remote device, *plus* data compression and "spoofing."**
- **All software included.**
- **Easy-to-use desktop components for LAN, WAN, and Internet connectivity.**

MORE! Details on these Routers and the OfficeConnect Hub 8, **see p. 537.**

With the 3Com OfficeConnect Remote series from Black Box, expanding and developing your small-office LAN is a snap. High-speed ISDN links enable you to connect to the Internet, and, if needed, to your corporate headquarters, business partners, or any other networked information resources that can enhance your business interests.

The OfficeConnect Remote series provides fast and economical ISDN connections while enabling high-speed voice or fax transmissions over the same ISDN line. Users get the transmission speeds they need to access complex graphical information and to keep data and voice traffic moving without delay!

These components can be mixed and matched to meet your office needs perfectly. Installation and configuration are so simple, your network will be up and running in minutes. If you need to expand, just clip on the additional unit.

SPECIFICATIONS

Line Type — Leased, PSTN, ISDN
Protocols — LAN: IP, IPX, AppleTalk®;
WAN: PPP
Speed — Up to 128 Kbps aggregate plus compression
CE Approval — All items listed are approved
Connectors — (1) BNC, (1) RJ-45
Power — 115 VAC, 60 Hz

FAXBACK INFORMATION
Request Document Number: 17680
Call 412-746-5500 Anytime

Item	Code	Price
3 Com® OfficeConnect™ Remote Routers		
510U-ISDN	3C410015A	**$849.00**
520U-ISDN and Integral Voice Line	3C410020A	**$1149.00**
530U-ISDN, Integral Voice, and Leased Line	3C410025A-US	**$999.00**
remember to order cables: Category 5 Patch Cable, (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		
ThinNet Cable, 10-ft. (3.0-m)	LCN300-0010	**$17.95**
For other lengths see p. 77.		

NOTE: Standard discounts may not apply.

* * *

Internet
E-Mail & Research
1–10 Users

Async Routers

Now Make Simultaneous On-Demand Internet Connections at 28.8 Kbps for All Attached Users!

V.34

- **All software included.**
- **Integrated V.34 modem with V.24 bis error correction and MNP® 5 data compression.**
- **V.34 modem makes 28.8-Kbps connections.**
- **SNMP management.**

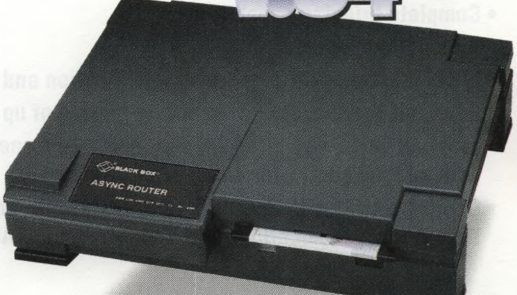
If your WAN traffic is less than heavy and constant, these Routers activate a link over a dialup line and route data traffic only as needed, so you're charged only when the link is in use.

Each Router comes with an integrated V.34 bis modem. The Async Router supports one remote connection over an ordinary dialup line. The AR-5 supports up to five remote LANs or remote PCs.

MORE! Details on these Routers, **see p. 541.**

SPECIFICATIONS

Line Type — PSTN
Protocols — LAN: IP, IPX;
WAN: PPP
Speed — 10-Mbps Ethernet;
28.8-Kbps integrated modem
Connectors — Both: (1) DB9 male, (1) DB15 AUI female, (1) RJ-45 female, (1) 5-pin DIN;
LRA001A-R2: (1) RJ-11;
LRA005A-R2: (5) RJ-11
Power — 115/230-VAC, 60/50-Hz external supply (autoswitching)
Size — 2.5"H x 9.8"W x 8.3"D (6.4 x 24.9 x 21.1 cm)



FAXBACK INFORMATION
Request Document Number: 12719
Call 412-746-5500 Anytime

Item	Code	Price
Async Router	LRA001A-R2	**$1695.00**
Async Router AR-5	LRA005A-R2	**$3995.00**
remember to order cables: Category 5 Patch Cable, (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		
RJ-45 (8-wire) Modular Cable, 7-ft. (2.1-m) Straight-pinned	EL08MS-07	**$4.95**
For other lengths and pinnings, see p. 71.		

Remote Token Ring
Local Token Ring
More LAN

E-Mail & Research
11–25 Users

Internet Access Routers

Link up to 20 Users to the Internet with One Router—and One User Connection from Your ISP.

MORE! Details on this Router, see p. 536.

- Complete bridging capabilities.
- All software included.
- Specially designed to link smaller- and medium-sized networks to the Internet.
- ISDN models available with built-in NT1.

SPECIFICATIONS

Line Type — Leased, PSTN, ISDN
Protocols — LAN: IP; WAN: PPP, Frame Relay
Speed — ISDN: Up to 128 Kbps;
RS-232, CSU/DSU: Sync: Up to 64 Kbps;
Async: Up to 115.2 Kbps;
RS-530, V.35, V.36, X.21: Up to 1.544 Mbps
CE Approval — All items listed are approved
Connectors — LAN: (1) BNC or (1) RJ-45;
Link: ISDN: RJ-45 (S or U interface);
CSU/DSU: RJ-45;
RS-232, RS-530: DB25 female;
V.35: 34-pin M-Block female;
RS-422 (V.36): DB37 female via adapter cable;
X.21: DB15 female via adapter cable
Indicators — (6) LEDs: Power, Ready, LAN Data, LAN Error, Link Data, Link Error
Power — 115–230 VAC, 50–60 Hz, 10 VA max.
Size — 1.8"H x 9.6"W x 8.5"D (4.6 x 24.4 x 21.6 cm)

FAXBACK INFORMATION
Request Document Number: 17824
Call 412-746-5500 Anytime

Unique "Single IP" Feature Simplifies Internet Connections.

These Internet Access Routers allocate just one IP address to serve as a single Internet access point—and simultaneously route traffic for up to 20 network users!

The alternative—establishing unique IP addresses for every LAN node—would be both time-consuming and expensive.

Single IP simplifies your Internet connection (saving the costs of consultants and installation), so you get the most connectivity for your money!

Item		BNC	UTP	Price
Internet Access Routers				
Basic Rate ISDN	S Interface	LR0002A-BSDN	LR0002A-TSDN	**$980.00**
	U Interface	LR0002A-BUDN	LR0002A-TUDN	**$980.00**
Built-in CSU/DSU		LR0002A-BCSU	LR0002A-TCSU	**$1190.00**
RS-232		LR0002A-BV24	LR0002A-TV24	**$890.00**
V.35		LR0002A-BV35	LR0002A-TV35	**$890.00**
RS-422 (V.36)		LR0002A-BV36	LR0002A-TV36	**$890.00**
X.21		LR0002A-BX21	LR0002A-TX21	**$890.00**
RS-530		LR0002A-B530	LR0002A-T530	**$890.00**
remember to order cables	Category 5 Patch Cable, 10-ft. (3.0-m), (Beige)		EVMSL05-0010	**$10.95**
	ThinNet Cable, PVC, 20-ft. (6.1-m)		LCN300-0020	**$20.95**

For other lengths and colors, see p. 69.

For other lengths, see p. 77.

◆ ◆ ◆

E-Mail & Research
26–100 Users
Branch Office
Ethernet Only
2 Remote Sites

3Com OfficeConnect NETBuilder Routers

Extend Your Corporate Intranet to Every Branch Office.

New

- **Complete bridging capabilities.**
- **All software included.**
- **IP firewall security at every remote location and WAN interface.**
- **Route all packets at maximum wire speeds of up to two T1/E1.**
- **Two LAN ports, one FlexWAN serial port, and one IDSN BRI port with integrated NT1 for direct ISDN connection.**
- **Control WAN traffic flow to provide bandwidth-on-demand for time-critical applications and maximize your WAN investment.**

3Com®

FAXBACK INFORMATION
Request Document Number: 18801
Call 412-746-5500 Anytime

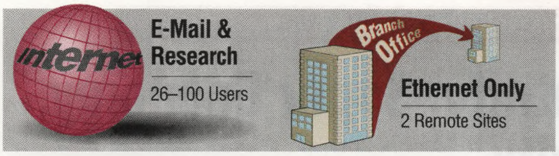
Just because you have a small office doesn't mean you shouldn't have the communication capabilities of a larger corporate office. Use the NETBuilder Router series to enable your remote branch offices to tap into central corporate sites, the Internet, or any other online service. These Routers support every major WAN protocol, so you can integrate your entire family of branch offices.

SPECIFICATIONS

Line Type — Leased, PSTN, ISDN
Protocols — LAN: All models: IP, IPX™;
143 models: SNA;
147 models: AppleTalk®, DECnet®,
WAN: PPP
Speed — Up to 3.088 Mbps (2 x T1) or 4.096 Mbps (2 x E1)
CE Approval — All items listed are approved
Interface — (2) LAN (UTP and BNC), (1) ISDN, (1) WAN (supports RS-232, X.21, or V.35)
Connectors — (1) RJ-45, (1) DB25

Item	Code	Price
3Com OfficeConnect NETBuilder Routers		
with U Interface		
141	3C8851	**$1495.00**
142	3C8852	**$1995.00**
143	3C8853	**$1795.00**
147	3C8857	**$2995.00**
with S/T Interface		
141	3C8841	**$1399.00**
142	3C8842	**$1849.00**
143	3C8843	**$1649.00**
147	3C8847	**$2749.00**
remember to order cables Category 5 Patch Cable, (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.


internet
E-Mail &
Research
26–100 Users
Branch Office
Ethernet Only
2 Remote Sites

Series 2000 ISDN Office Routers

Black Box Introduces Affordable ISDN Routers That Are Just the Right Size for Small Offices.

- Complete bridging capabilities.
- All software included.
- Perfect for the communication and budgetary needs of remote offices and telecommuters.
- Supports high-speed connections for Ethernet, voice, and data traffic—over just one ISDN BRI line (2B+D).
- Data compression gives you maximum bandwidth from each B channel for super-efficient links.
- BONDING—Bandwidth on Demand—gives you the line capacity you need during periods of peak usage.

New
BLACK BOX
(412) 746-5500
Series 2000 ISDN Office Router
Power
Lan
Link One
Link Two

SPECIFICATIONS

Line Type — Leased, PSTN, ISDN
Protocols — LAN: IP, IPX;
WAN: PPP
Speed — Up to 128 Kbps
CE Approval — All items listed are approved
Connectors — (1) DB15 AUI and (1) RJ-45; Models with voice capabilities also have (2) RJ-11 ports
Power — 115–230 VAC, 60–50 Hz autosensing
Size — 2.3"H x 8.5"W x 13"D (5.7 x 21.6 x 33 cm)
Weight — 11 lb. (5.1 kg) shipping weight

FAXBACK INFORMATION
Request Document Number: 18564
Call 412-746-5500 Anytime

BUYER'S GUIDE

SERIES 2000 ISDN OFFICE ROUTERS

Router Protocol	Features	ISDN Interface			Code	Price
		Voice	S/T	U		
IP	with PPP		✔		LR2000A-ISDN-S	$950.00
				✔	LR2000A-ISDN-U	$1050.00
		✔	✔		LR2000A-VISDN-S	$1150.00
		✔		✔	LR2000A-VISDN-U	$1250.00
IP/IPX™	with PPP		✔		LR2002A-ISDN-S	$1150.00
				✔	LR2002A-ISDN-U	$1250.00
		✔	✔		LR2002A-VISDN-S	$1350.00
		✔		✔	LR2002A-VISDN-U	$1450.00
	with Protocol Spoofing		✔		LR2004A-ISDN-S	$1150.00
				✔	LR2004A-ISDN-U	$1250.00
		✔	✔		LR2004A-VISDN-S	$1350.00
		✔		✔	LR2004A-VISDN-U	$1450.00
remember to order cables	Category 5 Patch Cable, 10-ft. (3.0-m), (Beige)				EVMSL05-0010	$10.95

For other lengths and colors, see p. 69.

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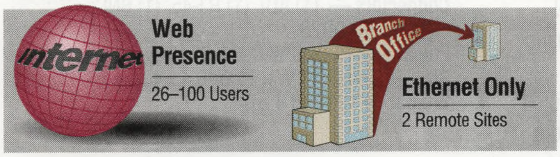
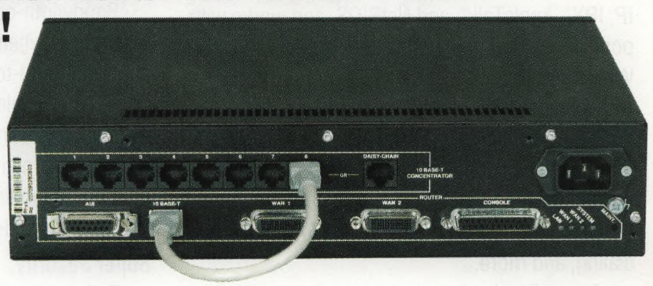

internet
Web
Presence
26–100 Users
Branch Office
Ethernet Only
2 Remote Sites

Remote Ethernet Hub/Router

A Fully Integrated Router and 10BASE-T Hub—All in One Box!


DAISY-CHAIN
10 BASE-T CONCENTRATOR
ROUTER
AUI
10 BASE-T
WAN 1
WAN 2
CONSOLE

- Complete bridging capabilities.
- All software included.
- Built-in Ethernet Hub provides direct LAN access for up to 7 users. Change Adapter Cables to switch WAN interfaces.
- Frame-Relay and X.25 support of up to 13 SVCs and PVCs!
- Supports IP filters for firewall protection.
- SNMP manageable.

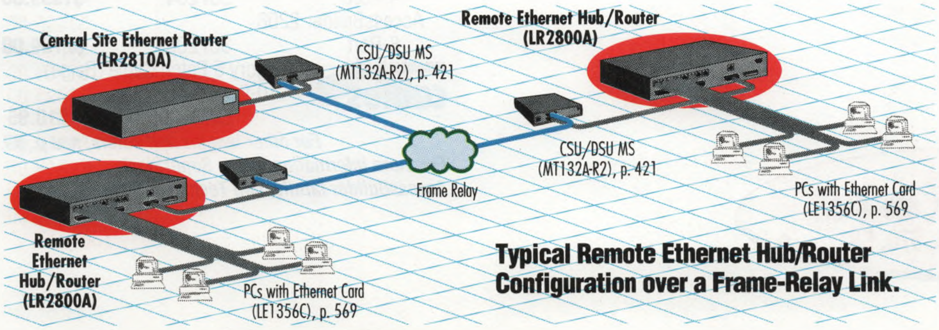
SPECIFICATIONS

Line Type — Leased, PSTN
Protocols — LAN: IP, IPX;
WAN: PPP, LAPB Frame Relay
CE Approval — All items listed are approved
Connectors — (1) DB15 AUI, (10) RJ-45, (2) HD50, (1) DB25
Power — Internal 110–240 VAC, 50–60 Hz, autosensing
Size — 2.8"H x 12"W x 9.6"D (7.2 x 30.6 x 24.5 cm)
Weight — 5.1 lb. (2.3 kg)

FAXBACK INFORMATION
Request Document Number: 16823
Call 412-746-5500 Anytime

Item	Code	Price
Remote Ethernet Hub/Router Frame Relay	LR2800A	$2295.00
Remote Ethernet Hub/Router X.25	LR2800A-X25	$2295.00
Central Site Ethernet Router	LR2810A	$2995.00
Adapter Cables		
V.24	CB2801-V24	$125.00
V.35	CB2801-V35	$125.00
V.36	CB2801-V36	$125.00
X.21	CB2801-X21	$125.00
remember to order cables — Category 5 Patch Cable, (Beige) 10-ft. (3.0-m)	EVMSL05-0010	$10.95

For other lengths and colors, see p. 69.


Central Site Ethernet Router
(LR2810A)
CSU/DSU MS
(MT132A-R2), p. 421
Remote Ethernet Hub/Router
(LR2800A)
CSU/DSU MS
(MT132A-R2), p. 421
Frame Relay
PCs with Ethernet Card
(LE1356C), p. 569
Remote
Ethernet
Hub/Router
(LR2800A)
PCs with Ethernet Card
(LE1356C), p. 569

Typical Remote Ethernet Hub/Router Configuration over a Frame-Relay Link.

Remote Token Ring
Local Token Ring
More LAN

internet
Web
Presence
26–100 Users
Branch
Office
Ethernet Only
2 Remote Sites

3Com® SuperStack II AccessBuilder Remote Access Servers

Super Versatility. Super Economy. Super Security.

New

- **Complete bridging capabilities.**
- **All software included.**
- **Provides dial-in/dial-out access to up to 50 remote users.**
- **Functions as an access server and a router for added versatility.**
- **Easy dial-in/dial-out access over analog or digital (ISDN) telephone lines.**
- **Supports a broad range of platforms, desktop systems, network operating systems, and network protocols.**
- **Advanced security features and third-party security support.**
- **Flexible, dynamic bandwidth management reduces dialup line charges.**

Now you can give telecommuters and business travelers full and complete access to your enterprise network with these new Remote Access Servers. The link is totally transparent. Remote workers can access your Ethernet LAN over analog or ISDN lines—just as if they were locally connected.

Super Versatility.

The AccessBuilder supports protocols such as IP, IPX™, AppleTalk®, and NetBIOS, and works with popular desktop programs such as Microsoft® Windows® 95. And that means remote users with all types of equipment—including PCs, and Macintosh and UNIX® based computer systems—can connect to your network via the AccessBuilder. Plus, setup is easy with a Windows based installation program, utilities for one-click dialing, and more.

AccessBuilders are easy to configure and administer with management options such as in-band SNMP, out-of-band, and local management. A built-in SNMP graphical management interface supports IP and IPX. The asynchronous ports for client-to-LAN and LAN-to-LAN connections are software configurable. And the front panel is loaded with LEDs to monitor the LAN and WAN port status.

Super Economy.

Remote users can dial in via analog or ISDN lines using common analog modems or ISDN terminal adapters. AccessBuilders can handle data rates up to 115.2 Kbps. And you can schedule batch transfers after hours, when rates are lower.

To save on line charges in LAN-to-LAN connections, AccessBuilder's dial-on-demand keeps line connections open only when in use.

Bandwidth-on-demand supplies additional throughput when needed. The AccessBuilder supports Point-to-Point Multilink Protocol to combine multiple links into one logical link, widening the transmission pipe. It's a cost-effective alternative to leased lines, and enables multiple dialup lines to function as a backup link in case of leased-line failure.

Super Security.

Built-in security prevents unauthorized network access through password protection, PAP, CHAP, automatic callback, and network filters. AccessBuilder also automatically logs and reports all unauthorized access attempts and works with third-party hardware and software security systems.

MORE!
3Com Products
pp. 486, 492, 494, 496, 509–510, 537–538, 561, 564–565, 570, 581.

SPECIFICATIONS

Line Type — Leased, PSTN, ISDN
Protocols — LAN: IP, IPX™, AppleTalk®, NetBIOS/NetBEUI;
WAN: PPP, Frame-Relay
Speed — 115.2 Kbps
CE Approved — All items listed are approved
Connectors — (1) AUI, (1) RJ-45, (1) BNC; (4) or (8) DB25
Power — 115–230 VAC, 60–50 Hz autosensing
Size — 2.5"H x 17"W x 11"D (6.4 x 43.2 x 27.9 cm)
Weight — 12 lb. (5.4 kg)

3Com®

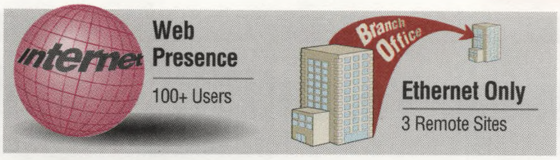
FAXBACK INFORMATION
Request Document Number: 18540
Call 412-746-5500 Anytime

Item	Code	Price
3Com® SuperStack II AccessBuilder Remote Access Servers		
AccessBuilder 2204 4-Port	3C7204	**$1999.00**
AccessBuilder 2208 8-Port	3C7208A	**$2799.00**
Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

remember to order cables

For other lengths and colors, see p. 69.

For more information on the SuperStack AccessBuilder family, call Technical Support.



T1 Multiprotocol Bridge/Router

Multiprotocol Support, Seamless Networking—Only From Black Box.

BLACK BOX
(412) 746-5500
POWER
PORT 1
PORT 2
PORT 3
LAN PORT
TX
RX
T1 Multiprotocol Bridge/Router

- **Complete bridging capabilities.**
- **All software included.**
- **Provides one Ethernet LAN port and three high-speed WAN ports.**
- **Built-in SNMP management.**

The T1 Multiprotocol Bridge/Router is the economical choice to *seamlessly* integrate your remote office computing resources into your corporate network. The Bridge/Router is equipped with three serial WAN ports and one Ethernet LAN port. On the LAN side, it supports Novell® IPX™/SPX and TCP/IP protocols while transparently bridging other protocols. WAN communications are transported via PPP, HDLC, and Frame-Relay protocols (aggregate throughput, 1.544 Mbps) with multiple WAN connectors. Or use Port 1 for your single T1 link.

SPECIFICATIONS

Line Type — Leased, PSTN, ISDN
Protocols — LAN: IP, IPX;
WAN: PPP, Frame Relay;
Speed — Ethernet: 10 Mbps;
DB25 (WAN): 64 Kbps, 1.544 Mbps aggregate
CE Approval — All items listed are approved
Connectors — (3) DB25 male; (1) 15-pin AUI
Indicators — LEDs: Port 1, 2, 3; Power, LAN Port
Power — 120–240 VAC, 50–60 Hz
Size — 2.1"H x 16.1"W x 8"D (5.3 x 41 x 20 cm)
Weight — 8 lb. (3.6 kg)

FAXBACK INFORMATION
Request Document Number: 17037
Call 412-746-5500 Anytime

Item	Code	Price
T1 Multiprotocol Bridge/Router	LR4202A	**$1590.00**
You may also need:		
CSU/DSU MS (**p. 421**)	MT132A-R2	**$725.00**
T1 CSU/DSU V.35 (**p. 436**)	MT100A-35-R2	**$1295.00**
remember to order cables		
LR4202-V.35 Cable, 3-ft. (0.9-m)	B1BB21651	**$60.56**
RS-232 Modem Cable, 15-ft. (4.6-m)	EHN081-0015	**$150.00**

NOTE: Specify gender when ordering cables.

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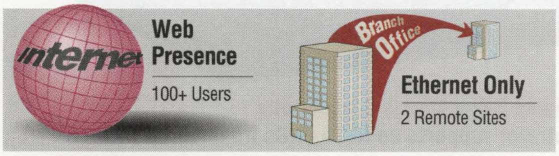


Cisco Series 1600 Modular Routers

Extend Network Access to the World Wide Web.

- Complete bridging capabilities.
- Fully modular.
- Choose from async/sync serial, serial with integrated CSU/DSU, ISDN BRI, or ISDN BRI with integrated NT-1 port module options.
- ClickStart™ setup for easy installation and configuration.
- Includes incorporated IOS™ IP feature set.

CISCO SYSTEMS
PARTNER
PREMIER RESELLER
PENNSYLVANIA

FAXBACK INFORMATION
Request Document Number: 18430
Call 412-746-5500 Anytime

SPECIFICATIONS

Line Type — Leased, PSTN, ISDN
Protocols — LAN: IP, IPX, AppleTalk;
WAN: PPP, Frame Relay;
CE Approved — CISCO1601–CISCO1604, WIC-1T, WIC-1B-S/T, WIC-1B-U
Power — 100–240 VAC, 50–60 Hz
Size — Chassis: 2.2"H x 11.2"W x 8.7"D (5.6 x 28.3 x 22 cm);
WAN Interface Cards: 0.8"H x 3.1"W x 4.8"D (2.1 x 7.9 x 12.2 cm)
Weight — Chassis: 1.8 lb. (0.8 kg);
WAN Interface Cards: 0.2 lb. (<0.1 kg)

Item	Code	Price
Cisco Series 1600 Modular Routers		
Ethernet	CISCO1601	**$1495.00**
w/56K DSU (4-Wire)	CISCO1602	**$1695.00**
ISDN-BRI	CISCO1603	**$1495.00**
w/NT-1	CISCO1604	**$1695.00**
Order the following for each Cisco 1600 Router...		
Cisco 1600 IP Feature Set	SF160C-11.1.8A	**$15.00**
You may also need additional...		
ISO Feature Sets		
IP Plus	SF160CP-11.1.8A	**$400.00**
IP/IPX Plus	SF160BP-11.1.8A	**$800.00**
IP/IPX/AT®	CD16-A/B/E-11.2	**$400.00**
Memory Modules		
8-MB DRAM SIMM	MEM1600-8D=	**$700.00**
8-MB Flash Card	MEM1600-8FC=	**$800.00**
WAN Interface Cards		
1-Port Serial	WIC-1T	**$400.00**
1-Port ISDN	WIC-1B-S/T	**$500.00**
1-Port ISDN w/NT-1	WIC-1B-U	**$700.00**
remember to order cables		
Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

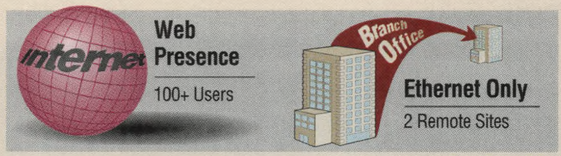
For other lengths and colors, see p. 69.

BUYER'S GUIDE

SERIES 1600 MODULAR ROUTERS

Features	Base Configuration	WAN Speed	WAN Connector	Optional WAN Card
Ethernet/Serial (CISCO1601)	1 Ethernet 1 Sync/Async Serial Port	Sync up to 2.048 Kbps	DB-60	Serial Sync/Async, ISDN BRI S/T, ISDN BRI U
with 56K DSU (CISCO1602)	1 Sync CSU/DSU Serial Port	4-Wire CSU/DSU at 56 Kbps	RJ-48S	Serial Sync/Async, ISDN BRI S/T, ISDN BRI U
Ethernet/ISDN-BRI (CISCO1603)	1 ISDN BRI S/T Port	Up to 256 Kbps	RJ-45	Serial Sync/Async
with NTI (CISCO1604)	1 ISDN BRI U Port with NTI Termination	Up to 256 Kbps	RJ-45	Serial Sync/Async

Multivendor Interoperability, Versatility, Simple


internet
Web Presence
100+ Users
Branch Office
Ethernet Only
2 Remote Sites

FAXBACK INFO
For the Series 4000 Frame-Relay Access Concentrator: 18571,
For All Other Remote Bridge/Routers: 15918,
Call 412-746-5500
Anytime

Remote Bridge/Routers

- **Complete bridging capabilities.**
- **Fully modular.**
- **All software included.**
- **Supports Telnet™.**
- **Compression options boost throughput 600%!**
- **Interoperable with routers from other vendors for easy, economical integration with existing network applications.**
- **Models available include Frame-Relay Access Concentrator to central site and Frame-Relay Bridge/Routers for remote sites.**

1
Frame-Relay
BLACK BOX®
FRAME RELAY BRIDGE/ROUTER
Power
Lan
Link One
Link Two

NEW LOW PRICE! $

PERFECT for LANs with three or more remote sites. Frame Relay is economical because it requires less hardware.

ABSOLUTELY GUARANTEED FOR LIFE

Frame-Relay Bridge/Router with CSU/DSU

- **Save money using Frame Relay instead of leased lines.**
- **Compression per PVC saves ongoing bandwidth charges.**
- **Congestion Control responds to network congestion notification by "throttling back" to the Committed Information Rate (CIR)—giving users optimal response time regardless of network conditions.**

These Bridge/Routers support the Link Management Interface (LMI) that supports Frame-Relay Permanent Virtual Circuits (PVC). A recovery backup link is configurable in point-to-point mode in case PVC or link fails. And you have in-band, out-of-band, or SNMP management access options.

The CSU/DSU supports 56-Kbps DDS leased-line operation and provides up to 10 miles of limited-distance modem operation on private wire.

Item	Code	Price
Frame-Relay Bridge/Router (Single-Link) with CSU/DSU		
without Compression		
AUI	LR3001A-FRA-R2	**$1795.00**
BNC	LR3001A-FRB-R2	**$1795.00**
10BASE-T	LR3001A-FRT-R2	**$1795.00**
with Compression		
AUI	LR3001A-CFRA-R2	**$1995.00**
BNC	LR3001A-CFRB-R2	**$1995.00**
10BASE-T	LR3001A-CFRT-R2	**$1995.00**
remember to order cables RJ-45 (8-Wire) Modular Cable, 7-ft. (2.1-m) Straight-Pinned	EL08MS-07	**$4.95**
For other lengths and pinnings, see p. 71.		
Category 5 Patch Cable, 10-ft. (3.0-m) (Beige)	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		

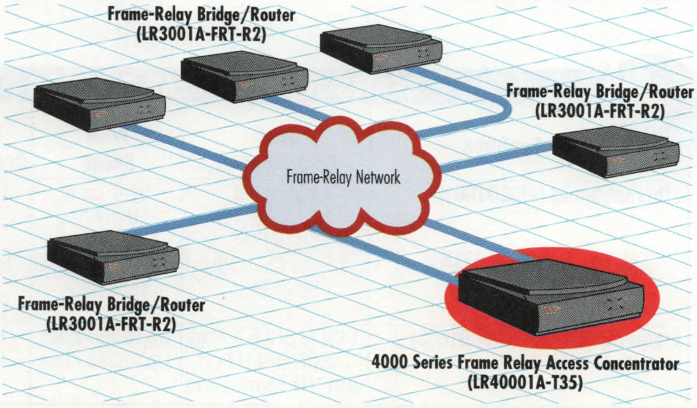
Also Bridge/Routers available with or without integral CSU/DSU.
2
BLACK BOX
(412) 746-5500
Series 4000 Frame Relay Access Concentrator
Power
Lan
Link One
Link Two

Series 4000 Frame-Relay Access Concentrator

- **One Concentrator supports up to 15 PVCs from multiple sites.**
- **Three LAN types to choose from for thick, Thin, or twisted-pair Ethernet connections.**
- **Each model has two T1/E1 WAN ports for aggregate throughput rates up to 4 Mbps.**
- **Per-PVC compression maximizes bandwidth.**

One or two high-speed Frame-Relay WAN ports provides up to 4 Mbps of aggregate throughput to service multiple remote circuits (see the diagram **below**). And you can manage your entire WAN easily through the Concentrator via your own management console, SNMP, or Telnet™.

Item	Code	Price
Series 4000 Frame-Relay Access Concentrators		
10BASE-T RJ-45	LR4000A-T35	**$3995.00**
10BASE2 BNC	LR4000A-B35	**$3995.00**
10BASE5 AUI	LR4000A-A35	**$3995.00**


Frame-Relay Bridge/Router (LR3001A-FRT-R2)
Frame-Relay Bridge/Router (LR3001A-FRT-R2)
Frame-Relay Network
Frame-Relay Bridge/Router (LR3001A-FRT-R2)
4000 Series Frame Relay Access Concentrator (LR40001A-T35)

Configuration—These Bridge/Routers Have It All!

SPECIFICATIONS FOR REMOTE BRIDGE/ROUTERS

Line Type — Leased, PSTN
Protocols — LAN: IP, IPX;
WAN: PPP, LAPB, Frame Relay
Speed — Series 4000: Up to 1.522 Mbps (T1) or 2.048 Mbps (E1);
Aggregate for WAN: Bridges: Up to 1.544 Mbps;
Bridges with compression: Up to 256 Kbps full-duplex, internal/external clock;
CSU/DSU: Up to 64 Kbps sync
CE Approval — All items listed are approved.
Indicators — LEDs; Telnet™ access; SNMP, DTE, DTE/LOOP, DTE with test pattern, loop only, test pattern
Power — 115–230 VAC, 60–50 Hz, autosensing
Size — Series 4000: 2.3"H x 8.5"W x 13"D (5.7 x 21.6 x 33 cm)
All others: 2.5"H x 8"W x 14.5"D (6.4 x 20.3 x 36.8 cm)
Weight — 11 lb. (5 kg)

STOP! X.21, RS-232, and Euro ISDN models are also available.

Call for More Information: 412-746-5500.

3
Built-in CSU/DSU
BLACK BOX
Power
Lan
Link One
Link Two

Run tests on the built-in CSU/DSU ***right*** *from the Bridge/Router's management port. Tests include self-test, digital loop, local loop, and remote loop.*

4
Speeds up to T1!
BLACK BOX
Power
Lan
Link One
Link Two

For simple remote Bridging, *these models support the must-have features and speeds you need.*

Bridge/Router with CSU/DSU

- **Bridge/Router and CSU/DSU in one saves you time, money, and rack space for simple network management.**
- **Firewall security protects data from intruders on Internet applications.**
- **Optional ISDN dial backup port keeps your network running during leased-line outages (call for part numbers and prices).**

The CSU/DSU supports 56-Kbps DDS leased-line operation and provides up to 10 miles of limited-distance modem operation on private wire. You can troubleshoot the CSU/DSU via the Bridge/Router's management port.

Item	Code	Price
Bridge/Router with CSU/DSU (Dual-Link)		
without Compression		
AUI	LR3002A-ADSU	**$2195.00**
BNC	LR3002A-BDSU	**$2195.00**
10BASE-T	LR3002A-TDSU	**$2195.00**
with Compression		
AUI	LR3002A-CADSU	**$2495.00**
BNC	LR3002A-CBDSU	**$2495.00**
10BASE-T	LR3002A-CTDSU	**$2495.00**
remember to order cables Category 5 Patch Cable, (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
		For other lengths and colors, see p. 69.
ThinNet Cable, 20-ft. (6.1.0-m)	LCN300-0020	**$20.95**
		For other lengths, see p. 77.
Ethernet Transceiver Cable, 10-ft. (3.0-m), PVC	LCN210-0010	**$51.95**
		For other lengths, see p. 78.

V.35 Bridge/Router and V.35 Bridge

- **Perfect for any application using leased lines.**
- **DDS, Fractional T1, T1—this Bridge/Router supports them all.**
- **Optional ISDN dial backup port keeps your network running during leased-line outages (call for part numbers and prices).**
- **Firewall security protects your data from intruders.**

Control network devices with the menu-based management software to manage and maintain extensive WAN and link statistics and perform diagnostics.

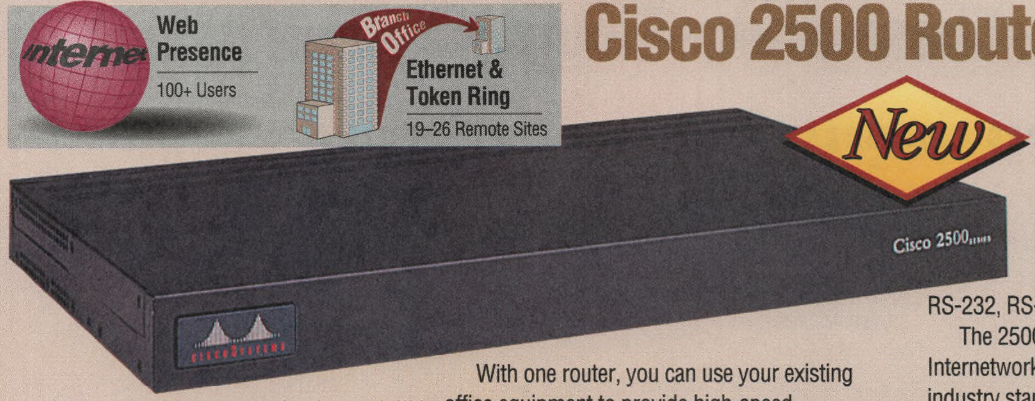
The Bridge/Router also supports Telnet™ login so you can manage it from any station supporting Telnet, such as a PC terminal server or host.

Item	Code	Price
V.35 Bridge/Router (Dual-Link)		
without Compression		
AUI	LR3002A-A35-R2	**$1595.00**
BNC	LR3002A-B35-R2	**$1595.00**
10BASE-T	LR3002A-T35-R2	**$1595.00**
with Compression		
AUI	LR3002A-CA35-R2	**$1795.00**
BNC	LR3002A-CB35-R2	**$1795.00**
10BASE-T	LR3002A-CT35-R2	**$1795.00**
V.35 Bridge (Dual-Link)		
without Compression		
AUI	LB3002A-A35-R2	**$2595.00**
BNC	LB3002A-B35-R2	**$2595.00**
10BASE-T	LB3002A-T35-R2	**$2595.00**
with Compression		
AUI	LB3002A-CA35-R2	**$2995.00**
BNC	LB3002A-CB35-R2	**$2995.00**
10BASE-T	LB3002A-CT35-R2	**$2995.00**
remember to order cables V.35 Adapter Cable, 6-ft., (1.8-m)	EHN078-002M	**$39.45**
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	**$23.95**
		For other lengths, see p. 83.

Remote Token Ring
Local Token Ring
More LAN

ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS

Cisco 2500 Routers: You Asked



CISCO SYSTEMS
PARTNER
PREMIER RESELLER
PENNSYLVANIA

- **Complete bridging capabilities.**
- **Fully modular.**

We heard your call, and we've answered. Black Box now offers the Cisco 2500 Family of Access Routers—the number one family of routers available today. They're the perfect solution for small-to-midsize offices that need to provide remote access in a convenient, cost-effective, yet enterprise-strength format.

With one router, you can use your existing office equipment to provide high-speed connectivity to your enterprise WANs and the Internet. You can also consolidate LAN and SNA traffic to reduce your operating costs and simplify management responsibilities.

Every device within the 2500 family has a minimum of two synchronous ports for fast, reliable data transfer. Intelligent, self-configuring serial cables simplify installation. Choose from these sync serial port high-density cables: V.35, RS-232, RS-449, X.21, and RS-530.

The 2500 Series' foundation is the Cisco Internetworking Operating System (Cisco IOS™) industry standard software for internetworking worldwide. Plus Cisco IOS™ supports a range of protocols so you're guaranteed interoperability with other devices. You get a single, unified infrastructure that provides lower cost, higher application availability, and improved internetwork management.

The 2500 Series also provides remote central-site management, data security, and multiprotocol capabilities over multiple transmission media.

ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS • ROUTERS

Cisco 2500 Series

Cisco 2501, 2503, and 2514 Routers

Increased WAN Performance and Rapid Internet Access for Branch Offices.

- **Turn multiple mixed-protocol LANs into scalable, easily manageable WAN links.**
- **Consolidate dual LAN/SNA networks into one integrated WAN.**
- **Second WAN port functions as an alternate or backup link.**
- **Perfect for dial backup, bandwidth-on-demand, and firewall configurations.**
- **Dual LAN model for economical local LAN segmentation.**

Protect your mission-critical applications with the second WAN port that can be used as an alternate or backup link; the 2503 model offers an additional ISDN port in case the primary link goes down.

SPECIFICATIONS

Memory — Flash: 8 MB of flash memory, upgradable to 16 MB;
Primary DRAM: 4 MB, upgradable to 18 MB via plug-in SIMM modules
Processor — 2 MHz
Connectors — All: (1) Ethernet AUI, (2) DB60;
Ethernet: 10 Mbps via AUI connector
Serial (DB60): V.35, RS-232, RS-449, X.21, RS-530; Speeds up to 2 Mbps;
Sync Serial: 2;
CISCO2503: (1) ISDN BRI U Interface;
CISCO2514: (1) Additional Ethernet AUI

Item	Code	Price
*Cisco 2501, 2503, and 2514 Routers		
Ethernet/Dual Serial	CISCO2501	**$2195.00**
Ethernet/Dual Serial/ISDN	CISCO2503	**$2895.00**
Dual Ethernet/Dual Serial	CISCO2514	**$2695.00**

Cisco 2505 and 2507 Hub/Routers

Integrated Router/Hubs Consolidate the Functions of a Router and a Hub into One Sleek Unit.

- Reduces operating costs, saves space, and simplifies management.
- SNMP-manageable for easy diagnosis and troubleshooting from a central site.
- Automatic configuration via intelligent WAN cabling.
- Second WAN port maximizes availability of mission-critical applications and serves as an alternate or backup link.

Item	Code	Price
*Cisco 2505, and 2507 Hub/Routers		
8 10BASE-T Ports	CISCO2505	**$2795.00**
16 10BASE-T Ports	CISCO2507	**$3295.00**

Cisco 2509 and 2511 Access Servers

Maximize Your Networking Budget—Get LAN, WAN, and Async Line Support in One Package.

Each of the Cisco 2500 Access Servers Series is a fixed-configuration router that supports at least two interface types. Each access server comes standard with Flash EPROM technology for simplified software maintenance.

SPECIFICATIONS

Async Lines Supported — CISCO2509: 8;
CISCO2511: 16
Connectors — LAN: (1) Ethernet AUI;
WAN: (2) Sync serial DB60;
CISCO2509: via 68-pin SCSI II connectors;
CISCO2511: (2) 69-pin SCSI II connectors

Item	Code	Price
*Cisco 2509 and 2511 Access Servers		
8 Async Ports	CISCO2509	**$2695.00**
16 Async Ports	CISCO2511	**$3295.00**

remember to order **cables** ***You must order one cable per eight ports to operate the Access Servers.***

Async Octal Cable For Cisco 2509–2512 Series Routers	EHC230-0003	**$349.95**

for Them, Black Box Delivers!

SPECIFICATIONS

Line Type — Leased, PSTN, ISDN

Protocols — LAN: IP, IPX, AppleTalk®, DECnet™, VINES™;
WAN: PPP, Frame Relay

CE Approval — All items listed are approved

Power — 100–240 VAC, autosensing, 50–60 Hz, 40 W max. at .5 to 1.0 Amps of current

Size — 1.8"H x 18"W x 10.6"D (4.6 x 45.7 x 27 cm) which equals 1 rack unit

Weight — 10 lb. (4.5 kg)

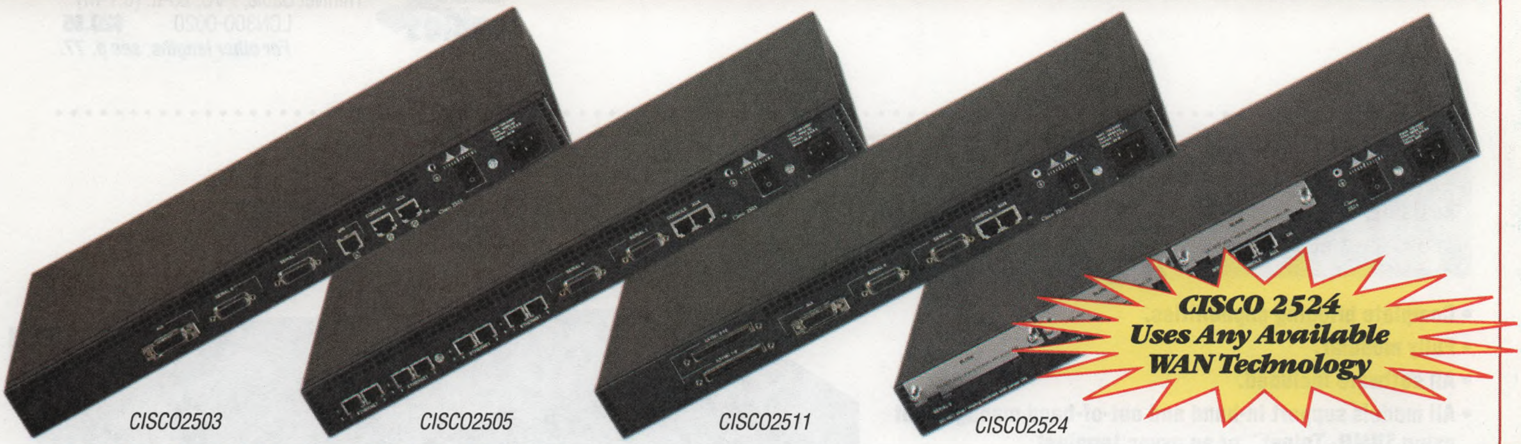
FAXBACK INFORMATION
Request Document Number: 18416
Call 412-746-5500 Anytime

Item	Code	Price
You will need one set for each 2500 Series Router…		
Cisco IOS™ IP Feature Set*	CD25-C-11.2	**$15.00**
…then you will need to order cable(s):		
V.35 DTE *Cisco Part #CAB-V35MT*	EHC100-0010	**$99.95**
DCE *Cisco Part #CAB-V35FC*	EHC110-0010	**$99.95**
RS-232 DTE *Cisco Part #CAB-232MT*	EHC120-0010	**$99.95**
DCE *Cisco Part #CAB-232FC*	EHC130-0010	**$99.95**
RS-449 DTE *Cisco Part #CAB-449MT*	EHC140-0010	**$99.95**
X.21 DTE *Cisco Part #CAB-X.21MT*	EHC160-0010	**$99.95**
EIA-530 DTE *Cisco Part #CAB-530MT*	EHC150-0010	**$99.95**

PLUS! CiscoWorks™, **see p. 553.**
HOT NEW PRODUCTS

Item	Code	Price
You may choose optional memory…		
8 MB of DRAM	MEM-1x8D	**$700.00**
4 MB Flash SIMM	MEM-1x4F	**$400.00**
8 MB Flash SIMM	MEM-1x8F	**$700.00**
4 to 8 MB Flash Upgrade	MEM-1x8F-U	**$455.00**
…and Rackmount Kit:		
Cisco Rackmount Kit	ACS-2500RM-19=	**$100.00**

* *The 2500 Router Series includes the IP-only Feature Set. The Cisco IOS™ IP Feature Set (CD25-C-11.2) is required to activate your router's functionality. You should also remember to order cable.*



Cisco 2524 and 2525 Modular 3-Port Routers

Get the Versatility You Need—Modular Design Plus WAN and DDS Connectivity Options.

- **Three plug-in slots for WAN and ISDN modules eliminate the need for external devices and cabling and simplify installation and maintenance for 56K, fractional or full T1, ISDN, or sync port speeds up to 2 Mbps.**
- **Modular, field-upgradable design for flexible configuration options.**
- **Built-in SNMP management monitors activity on and centralizes control of the WAN interface.**

With the 2524/2525 series, you get all the router functionality of the 2501 series, plus module options for integrated CSU/DSU and ISDN BRI interfaces—so you can easily extend your remote office locations.

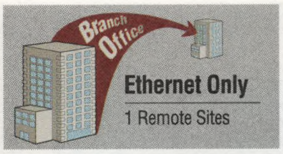
Three plug-in slots accommodate up to two WAN modules and one ISDN module. Synchronous WAN module options include five-in-one synchronous serial, two-wire switched 56K CSU/DSU, four-wire 56/64K CSU/DSU, and fractional/full T1 CSU/DSU. You can select ISDN BRI modules either with or without integrated NT1.

SPECIFICATIONS

Connectors — CISCO 2524: (1) Ethernet via AUI and 10BASE-T port; CISCO 2525: (1) Token Ring via DB9 and RJ-45 port

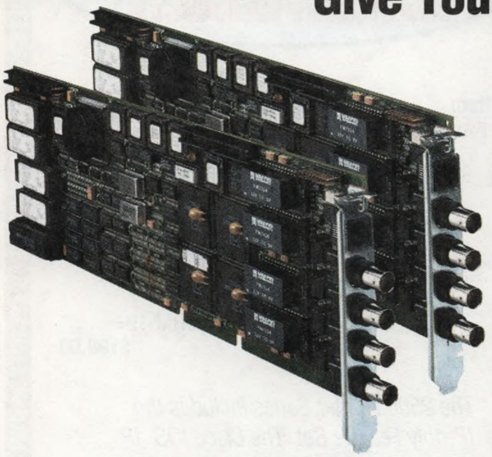
Item	Code	Price
*Cisco 2524 and 2525 Modular 3-Port Routers		
Ethernet	CISCO2524	**$2100.00**
Token Ring	CISCO2525	**$1400.00**
CSU/DSU Modules		
Two-Wire Switched 56 Kbps	SM25-56K2	**$900.00**
Four-Wire 56/64 Kbps	SM25-56K4	**$700.00**
Fractional T1/T1	SM25-T1	**$1600.00**
5-in-1 Synchronous Serial Module	SM25-5IN1	**$200.00**
ISDN BRI Module	SM25-BRI-S/T	**$600.00**
with Integrated NT1 Device Module	SM25-BRI-U	**$750.00**

Remote Token Ring
Local Token Ring
More LAN



RISC Bridge/Router Cards

Revive the Dinosaur! RISC Cards Give Your Old 286 Networking Power.



- **Complete bridging capabilities.**
- **All software included.**
- **Connect up to four local networks to one PC.**
- **Also connect to a remote network with optional WAN card.**
- **Local traffic is forwarded at super-fast RISC speed—14,880 packets per second!**
- **Draws power from the PC—no need to connect to an AC outlet.**

Break your 286 out of the closet! Our RISC Cards can give your old PC new life—connect it up to *four* local networks!

Use the RISC Card's four BNC connectors to bridge your local networks. For remote networking power, plug a WAN Card into the RISC Card's DB25 port and connect to a CSU/DSU.

Local traffic is forwarded at *14,880 pps* per port. WAN link speed is up to 256 Kbps.

Can Black Box revive your dinosaur? You bet!

FAXBACK INFORMATION
Request Document Number: 15231
Call 412-746-5500 Anytime

SPECIFICATIONS

Line Type — Leased, PSTN, ISDN
Protocols — LAN: IP;
WAN: PPP, LAPB, Frame-Relay
CE Approval — All items listed are approved
Power — From the PC

Item	Code	Price
RISC Bridge/Router Card (PC)	LR1000C-R2	**$2795.00**
Optional WAN Card	LR1100C-R2	**$299.00**
ThinNet Cable, PVC, 20-ft. (6.1-m)	LCN300-0020	**$20.95**

remember to order cables

For other lengths, see p. 77.

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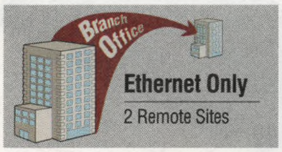


Standalone RISC Bridge/Routers

Why RISC Your Data with Anything Other than a BLACK BOX® RISC Bridge/Router?

- **Complete bridging capabilities.**
- **Fully modular.**
- **All software included.**
- **All models support in-band and out-of-band management using SNMP, Telnet™, or an async terminal.**
- **WAN interfaces support RS-232, EIA 530, V.35, or X.21.**
- **Advanced filtering for complete control of network traffic.**

BLACK BOX
RISC Router/2A

Build your multipoint WAN with a unit that combines the best of high-performance bridging *and* routing. Add as many as four local links to each end of your WAN connection. Local traffic is forwarded at super-fast RISC speed—14,880 pps per port. WAN link speed can be up to 256 Kbps—or even 7.1 Mbps!

Standalone RISC Bridge/Routers are your best choice for remote sites, such as field offices. Choose from multiprotocol models or our more economical single-protocol models. All models can be rackmounted for added convenience.

SPECIFICATIONS

Line Type — Leased, PSTN
Protocols — LAN: IP, IPX™, AppleTalk®;
WAN: Frame-Relay
Speed — LR1002A, LR2002A: 7.1 Mbps;
All other models: 256 Kbps
CE Approval — All items listed are approved
Power — 90–132/180–264 VAC, 40 watts
Size — 1.8"H x 19"W x 12"D (4.6 x 48.3 x 30.5 cm)
Weight — 5 lb. (2.3 kg)

FAXBACK INFORMATION
Request Document Number: 15231
Call 412-746-5500 Anytime

Item	Code	Price
Standalone RISC Bridge/Routers		
Single LAN		
1 AUI (IP only)	LR1003A	**$1995.00**
1 AUI	LR1010A	**$2195.00**
Multiprotocol		
2 BNC	LR2000A-R2	**$2495.00**
2 AUI	LR2001A-R2	**$2495.00**
4 BNC	LR4000A-R2	**$3295.00**
4 AUI	LR4001A-R2	**$3295.00**
1 AUI	LR1002A	**$3495.00**
2 AUI	LR2002A	**$3995.00**
RISC Bridge V.35 WAN Cable, 6-ft. (1.8-m), M-M (for LR1003A, LR2000A-R2, LR2001A-R2, LR4000A-R2, LR4001A-R2)	EHM047-0006	**$39.45**
V.35 Cable for LR1010A	LRRISC-DB25	**$95.00**
V.35 Cable for LR1002A, LR2002A	LRRISC-DB50	**$110.00**

Branch Office
Ethernet &
Token Ring
3 Remote Sites

BayStack Access Nodes and Access Node Hub

Ensure Network Availability While Minimizing Your Network Operating Costs.

New

Bay Networks
BayStack Access Node

16-MB BayStack Access Node (AE1101008)

- **Complete bridging capabilities.**
- **Fully modular.**
- **Interfaces for sync and ISDN WAN, AUI and 10BASE-T Ethernet, DB9 Token Ring, sync RS-232, V.35, X.21, and ISDN BRI.**
- **Dial Backup ensures uninterrupted remote-office operation.**
- **Bandwidth-on-Demand gets data through primary link congestion.**

With BayStack Access Nodes and Hubs you can create or expand your network without extensive changes to the routers' hardware and software. Plus, the AN and ANH support most major protocols and services and are fully interoperable with other network devices—so you can share resources and reduce your overall network operating costs.

The AN supports Ethernet and/or Token Ring LAN interfaces as well as sync and ISDN WAN interfaces. The ANH supports all of the previous items and incorporates an 8- or 12-Port 10BASE-T Hub. Order Adapter Modules if you need an additional sync port or an ISDN port. The ANH functions as both a hub and router—simplifying equipment and management requirements.

For security against power outages and surges, order the Redundant Power Supply Unit for use with both the AN or ANH.

SPECIFICATIONS

Line Type — Leased, PSTN, ISDN

Protocols — LAN: IP, IPX, AppleTalk®, DECnet™, VINES™
WAN: PPP, Frame-Relay

CE Approval — All items listed are approved

Connectors — Ethernet: (1) DB15 AUI, (1) RJ-45;
Token Ring: DB9 female;
Synchronous: RS-232, V.35, X.21;
ISDN BRI: RJ-45

Power — 100–240 VAC, autosensing

Size — AE1001006–AE1001008, AE1101002–AE1101004, AE1101006–AE11001008: 3.3"H x 17.5"W x 9.5"D (8.5 x 44.5 x 23.2 cm); AE1001010–AE1001012, AE1001014–AE1001016: 1.8"H x 17.3"W x 11.3"D (4.5 x 43.8 x 28.6 cm)

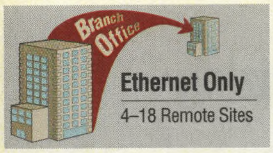
Weight — AE1001006–AE1008, AE1101002–AE1101004, AE1101006–AE11001008: 12 lb. (5.8 kg); AE1001011–AE1001012, AE1001014–AE1001016: 7.5 lb. (3.2 kg)

Bay Networks

FAXBACK INFO
Request Document Number: 17556
Call 412-746-5500
Anytime

Item	Code	Price
1 Choose your base unit depending on the connections you need...		
BayStack Access Nodes		
(1) Ethernet, (2) Sync Interfaces		
4-MB	AE1001006	**$1425.00**
8-MB	AE1001007	**$1965.00**
16-MB	AE1001008	**$2745.00**
(1) Token Ring, (2) Sync Interfaces		
4-MB	AE1101002	**$1835.00**
8-MB	AE1101003	**$2375.00**
16-MB	AE1101004	**$3155.00**
(1) Ethernet, (1) Token Ring, (2) Sync Interfaces		
4-MB	AE1101006	**$2455.00**
8-MB	AE1101007	**$3015.00**
16-MB	AE1101008	**$3785.00**
BayStack Access Node Hubs		
(8) 10BASE-T Ethernet Ports, (2) Sync Interfaces		
4-MB	AE1001010	**$1745.00**
8-MB	AE1001011	**$2275.00**
16-MB	AE1001012	**$3045.00**
(12) 10BASE-T Ethernet Ports, (2) Sync Interfaces		
4-MB	AE1001014	**$1985.00**
8-MB	AE1001015	**$2535.00**
16-MB	AE1001016	**$3315.00**
2 Choose your LAN/WAN PCMCIA protocol firmware requirements...		
IP Access Suite		
4-MB	AE0008032	**$355.00**
8-MB	AE0008036	**$845.00**
Remote Office Suite		
4 MB	AE0008033	**$755.00**
8 MB	AE0008037	**$1245.00**
Corporate Suite		
4-MB	AE0008034	**$1855.00**
8-MB	AE0008038	**$2345.00**
3 Choose your WAN cable...		
remember to order cables — V.35 Cable	7220	**$195.00**
X.21 Cable	7224	**$195.00**
RS-232 Cable	7826	**$99.00**
RS-422 Cable	7318	**$195.00**
4 You need to order the Quick2Config Software...		
Quick2Config Software	AH3334001	**$49.00**
Select any additional LAN/WAN ports you need...		
Adapter Modules		
for the 12-Port Access Node Hub		
ISDN BRI	50022	**$355.00**
Third Synchronous	50025	**$395.00**
Second Synchronous	AE0011010	**$495.00**
for the 8-Port Access Node Hub		
ISDN BRI	AE0011013	**$405.00**
Third Synchronous	AE0011012	**$395.00**
Second Synchronous	AE0011014	**$495.00**
Select any additional memory options you need...		
DRAM SIMMs		
4-MB Spare	50003	**$549.00**
4-MB to 8-MB Spare/Upgrade	50004	**$699.00**
4-MB to 8-MB to 16 MB Spare/Upgrade	50005	**$1559.00**
Flash PCMCIA Card Spares		
4-MB	AE0011007	**$389.00**
8-MB	AE0011024	**$999.00**
AN/ANH-12 Boot/Diag PROM Upgrade Kit	50024	**$119.00**
For increased security against power outages or surges...		
Redundant Power Supply Unit	RPSU	**$2589.00**

Remote Token Ring
Local Token Ring
More LAN



Multiport ISDN Router • Expandable Bridge/Router

The Ideal Routing Solution for Your Low- and High-Bandwidth Applications.

New

BLACK BOX (412) 746-5500
Multiport ISDN Router
10BASE-T
POWER
LAN
LINK
1 2 3 4 5 6 7
8 9 10 11 12 13 14

ABSOLUTELY GUARANTEED FOR LIFE

- **Complete bridging capabilities.**
- **Fully modular.**
- **All software included.**
- **Supports in-band management through Telnet™ and out-of-band management through SNMP.**
- **Redundant power supply keeps your network running in mission-critical applications.**
- **Interconnect up to 7 remote LANs over leased lines, or use the Expansion Card to interconnect up to 14.**
- **Leased-line support at speeds up to 2.048 Mbps (LR6007A–LR6114A).**
- **ISDN support of seven BRIs and 14 B channels (LR6214A).**

For a full complement of bandwidth-, resource-, and cost-management features, choose the Multiport ISDN Router and the Expandable Bridge/Router.

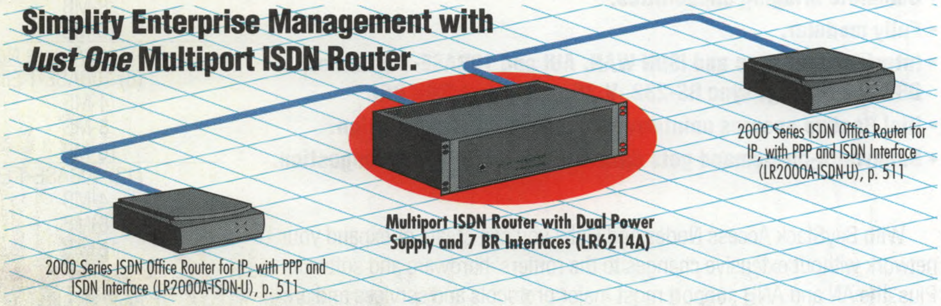
Boost your average network throughput to 600% of the available bandwidth—eliminating the need to purchase additional bandwidth. And that means you reduce your network costs.

Thanks to the data filters, you can control access to your sensitive data so even your strictest security requirements are met. And in switched access applications, call authentication prevents intruders from entering your network.

In ISDN environments, the Multiport ISDN Router prevents excessive online charges by sensing idle periods and spoofing the ISDN call. Spoofing closes the ISDN call to save online charges, and then automatically re-establishes the ISDN connection when data transfer is needed.

In dialup applications such as telecommuting, the Routers' multiple hunt groups reduce the number of BRIs needed at the central sites, so you can reduce your ISDN costs even more. By selectively grouping ISDN B-channels into contention groups, the operator can support both periodically and frequently connected remote sites with fewer B channels.

Simplify Enterprise Management with *Just One* Multiport ISDN Router.


2000 Series ISDN Office Router for IP, with PPP and ISDN Interface (LR2000A-ISDN-U), p. 511
Multiport ISDN Router with Dual Power Supply and 7 BR Interfaces (LR6214A)
2000 Series ISDN Office Router for IP, with PPP and ISDN Interface (LR2000A-ISDN-U), p. 511

NOTE: The Expandable Bridge/Router is configured to support leased-line applications. The Multiport ISDN Router is configured to support ISDN applications. Optional software is available to configure the Expandable Bridge/Router for ISDN-only applications. (Call Tech Support for more details.)

SPECIFICATIONS

Line Type — Leased, PSTN, ISDN

Protocols — LAN: IP, IPX;
WAN: PPP, LAPB, Frame-Relay

Software — In Flash ROM

Speed — Aggregate for WAN: Up to 1.544 Mbps

CE Approval — All items listed are approved

Connectors — LAN: (8) expansion slots;
WAN: LR5000A-R2: (2) DB37 support RS-232, ITU V.35, RS-530;
LB526A–LB527A: (2) Micro DB50HD

Power — 115–230 VAC, 50–60 Hz, autosensing

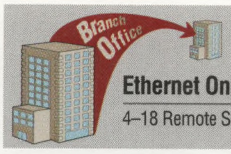
Size — LR5000A-R2:5.5"H x 17.5"W x 14.3"D (14 x 44.5 x 36.3 cm)

Weight — LR5000A-R2: 23 lb. (10.4 kg)

Item	Code	Price
For ISDN Applications:		
Multiport ISDN Router with 7 IDSN BRI Interfaces and Dual Power Supply	LR6214A	**$6195.00**
For Leased-Line Applications:		
Expandable Bridge/Router Single Power Supply		
for Support of up to 7 LANs	LR6007A	**$8750.00**
for Support of up to 14 LANs	LR6014A	**$11,750.00**
Dual Power Supply		
for Support of up to 7 LANs	LR6107A	**$9250.00**
for Support of up to 14 LANs	LR6114A	**$12,250.00**
WAN Interface Modules for Expandable Bridge/Routers		
V.11/X.21, DB15F	LR6211	**$95.00**
RS-232, DB25F	LR6212	**$95.00**
V.35, DB25F	LR6213	**$95.00**
RS-530, DB25F	LR6214	**$95.00**
Expansion Card (to Take You from 7 to 14 Ports)	LR6237C	**$3500.00**
remember to order cables V.35 Adapter Cable, 6-ft. (1.8-m)	EHN078-002M	**$39.45**
RJ-45 (8-Wire) Modular Cable, 7-ft. (2.1-m), Straight-Pinned	EL08MS-07	**$4.95**

For other lengths and pinnings, see p. 71.

FAXBACK INFORMATION
Request Document Number: **13868**
Call 412-746-5500 Anytime



Ethernet Only
4–18 Remote Sites

RISC Bridge/Router Chassis

The Expandable Bridge/Router Solution for Complete Ethernet and WAN Support.

PORT ACTIVITY
FAULT
PWR ON
BLACK BOX®
RISC ROUTER EXPANDABLE

The Expandable RISC Bridge/Router Chassis features eight slots for fast changes and easy expansion in busy central sites.

- **Complete bridging capabilities.**
- **Fully modular.**
- **All software included.**
- **Supports in-band and out-of-band management using SNMP, Telnet™, or an async terminal.**
- **DB25 WAN interfaces support RS-232, EIA 530, V.35, or X.21.**
- **Advanced filtering provides complete control of network traffic.**
- **Modules available for single Ethernet, dual Ethernet, and dual WAN connections up to 7.1 Mbps.**

Here's the bridging solution for busy, constantly changing central sites. The Expandable RISC Bridge/Router has two built-in WAN interfaces in addition to eight expansion slots that hold Expansion Cards for WAN and local Ethernet interfaces.

The RISC chassis is the ideal choice for segmenting congested networks, high-speed backbone configurations, and packet-switched applications.

With Constellation software already installed, you have a single software architecture that simplifies your support requirements and routes all applicable LAN and WAN protocols.

Choose from six available modules for even greater configuration flexibility and support of up to 16 LANs in a single chassis.

Single and Dual Ethernet cards have AUI and/or BNC connectors for ThinNet or Standard Ethernet connections. Use these cards to connect to thick, Thin, fiber, or any other Ethernet type supported by your transceiver.

The Dual WAN expansion modules are ideal for remote uses using leased lines, point-to-point applications, and packet networks with a large number of virtual circuits. The 512K model meets most typical application needs. The high-speed model enables you to operate your dual WAN card at speeds in excess of 7 Mbps per port.

SPECIFICATIONS

Line Type — Leased, PSTN
Protocols — LAN: IP, IPX™, AppleTalk®;
WAN: PPP, LAPB, Frame Relay
Speed — LR5000A-R2: 384 Kbps;
LB526A: 512 Kbps
LB527A: 7.1 Mbps
CE Approval — All items listed are approved
Connectors — LAN: (8) expansion slots;
WAN: LR5000A-R2: (2) DB37 support RS-232, ITU V.35, RS-530;
LB526A–LB527A: (2) Micro DB50HD
Power — 115/230 VAC, 60/50 Hz
Size — LR5000A-R2: 5.5"H x 17.5"W x 14.3"D (14 x 44.5 x 36.3 cm)
Weight — LR5000A-R2: 23 lb. (10.4 kg)

FAXBACK INFORMATION
Request Document Number: 15231
Call 412-746-5500 Anytime

Item	Code	Price
RISC Bridge/Router Chassis	LR5000A-R2	$5995.00
Plug-In Modules		
Single Ethernet with 1 BNC/1 AUI female	LB521C-R2	$795.00
Dual Ethernet		
with 2 AUI female	LB525C-AUI	$1295.00
with 2 BNC	LB525C-BNC	$1295.00
Dual WAN		
for 512 Kbps	LB526C	$1495.00
for 7.1 Mbps	LB527C	$1995.00
Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	$10.95
V.35 Cable		
for LR5000A-R2 (DB37)	LRRISC-DB37	$95.00
for LB526C and LB527C (DB50)	LRRISC-DB50	$110.00

remember to order **cables**

For other lengths and colors, see p. 69.

Branch Office
Ethernet & Token Ring
19–26 Remote Sites

Cisco Series 3600 Modular High-Performance Access Routers

Complete LAN-to-LAN/User-to-LAN Internetworking Solutions.

Cisco 3600
Cisco 3600

CISCO SYSTEMS
PARTNER
PREMIER RESELLER
PENNSYLVANIA

With the 3600 Series, you have your choice of Modules for complete configuration flexibility as well as complete LAN and WAN connectivity over any type of network topology.

New

- **Complete bridging capabilities.**
- **Fully modular.**
- **2- and 4-Slot models provide users with complete configuration flexibility.**
- **Choose from 10 mixed-media, network, and WAN interface Expansion Modules, two Memory Modules, and four additional IOS Feature Sets.**
- **Centralizes management and configuration support.**
- **Both chassis models offer RISC processors, dual Type II PC Cards, high-speed, and front-mounted console and auxiliary ports.**
- **Fully supported by the integrated Cisco IOS™ software.**

Regardless of your network topology, the Cisco 3600 Series Modular High-Performance Access Routers can accommodate your needs.

The 2- and 4-Slot chassis models accept Ethernet and Token Ring network modules, and a variety of WAN interface cards. And that means you get fully integrated LAN and WAN connectivity in one convenient package.

Once you've determined the Modules you need, just plug them in. You can configure any combination of Modules and cards you want depending on your internetworking needs.

Both the 3620 and 3640 models offer 4-MB Flash Memory (upgradable to 32 MB) and 12-MB DRAM (upgradable to 128 MB).

High-performance RISC processing supports overall performance requirements and dual Type II PC Cards provide local system image backup.

The 3600 Series includes Cisco's industry-standard IOS software. You can also select additional IOS software Feature Sets for IP and IP/IPX™ routing.

Cisco IOS™ provides users with a secure, reliable, and cost-effective means of linking various platforms, LAN segments, and internetworking devices. It enables you to maintain the value of your network infrastructure as you integrate and migrate to new network technologies. It also reduces operating costs by conserving resources, easing configuration tasks, and keeping bandwidth and processing overhead low.

SPECIFICATIONS

Line Type — Leased, PSTN, and ISDN
Protocols — LAN: IP, IPX, AppleTalk®, DECnet™, VINES™;
WAN: PPP and Frame
CE Approval — All items listed are approved
Power — 100–240 VAC, 47–64 Hz
Size — CISCO3620: 1.7"H x 17.5"W x 14.3"D
(4.3 x 44.5 x 36.2 cm);
CISCO3640: 3.4"H x 17.5"W x 15.8"D
(8.7 x 44.5 x 40 cm)
Weight — CISCO3620: 14 lb. (6.4 kg);
CISCO3640: 18 lb. (8.2 kg)

FAXBACK INFORMATION
Request Document Number: 18447
Call 412-746-5500 Anytime

Item	Code	Price
First, order your Router…		
Cisco Series 3600 Modular High-Performance Access Routers		
2-Slot	CISCO3620	**$2900.00**
4-Slot	CISCO3640	**$6500.00**
Next, you'll need to order one of these IOS IP Feature Sets for each Router ordered…		
For CISCO3620	SF362C-11.1.8A	**$15.00**
For CISCO3640	SW364C-11.1.8A=	**$10.00**
Then select the Expansion Modules you may need…		
Mixed-Media		
1 Ethernet/2 WAN	NM-1E2W	**$1500.00**
2 Ethernet/2 WAN	NM-2E2W	**$3000.00**
1 Ethernet/1 Token Ring/2 WAN	NM-1E1R2W	**$4000.00**
Async/Sync		
4-Port	NM-4A/S	**$2000.00**
8-Port	NM-8A/S	**$3200.00**
ISDN BRI		
4-Port ISDN-BRI	NM-4B-S/T	**$1100.00**
w/NT-1	NM-4B-U	**$1500.00**
8-Port ISDN-BRI	NM-8B-S/T	**$1600.00**
w/NT-1	NM-8B-U	**$2400.00**
Serial/ISDN PRI		
1-Port Channelized T1/ISDN-PRI	NM-1CT1	**$2600.00**
Select Memory Modules to upgrade or add memory…		
8-MB Flash	MEM3600-8FS=	**$800.00**
8-MB DRAM (CISCO3640 only)	MEM3640-8D=	**$800.00**
And if you need additional IOS Feature Sets, select…		
IP/IPX (for CISCO3620)	SF362D-11.1.8A	**$400.00**
IP/IPX (for CISCO3640)	SW364D-11.1.8A=	**$400.00**
For rackmount convenience, select the…		
19" Rackmount Kit	ACS-2500RM-19=	**$100.00**
Cisco Cables		**See page 102.**

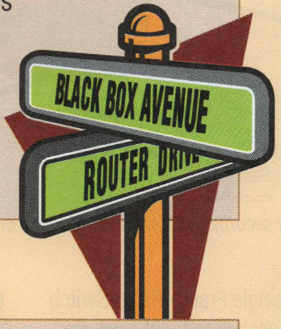
remember to order
cables

The Rest of the Story...

**Here are other specifications you may want to consider when choosing a Router.
For more information on these features, call Technical Support.**

Forwarding Rate

The rate at which the router reads the data packet, checks the destination address, and then forwards the data to its destination. If the data contains addresses or protocols incompatible with the routing criteria, the packet is filtered and not sent through to any connected network devices.



Filtering Rate

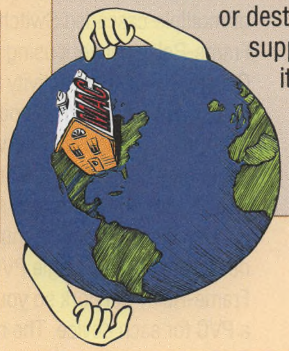
The rate at which a router filters out and discards packets that do not meet specific routing criteria—which is based on addresses or protocols. Data packets are filtered in order to control access to a network or to resources such as files and devices. If a packet is not filtered and discarded, it is forwarded to its appropriate destination or MAC address.

LAN Ports

The physical point of access from a router into an Ethernet or Token Ring cabling system. A LAN port supports one physical connection, and a typical router has one connector per port. Some routers have multiple connectors per port, but only one connector per LAN port can be used at a time.

MAC Addresses Supported

The maximum number of Media Access Control Addresses—or destination addresses—the router can support. When a router receives information, it checks the MAC address so it knows where to send the data or whether to discard the data if no matching address is found.



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OUR BEST PRODUCT!

Why Buy from Black Box?

You Know the Answer by Now: Expert Technical Support.

Record-Setting Fast Service within three to five rings. Assistance anytime—day, night, weekends, holidays. Easy-to-understand answers. Over 100 trained technical support specialists. And our advice is FREE—no contracts, no limits, no obligation. 1.2 million customers worldwide can't be wrong. Call Black Box TODAY.

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The World's Premier Tech Support Service Provider!

BLACK BOX® Bridges
Just turn the page!

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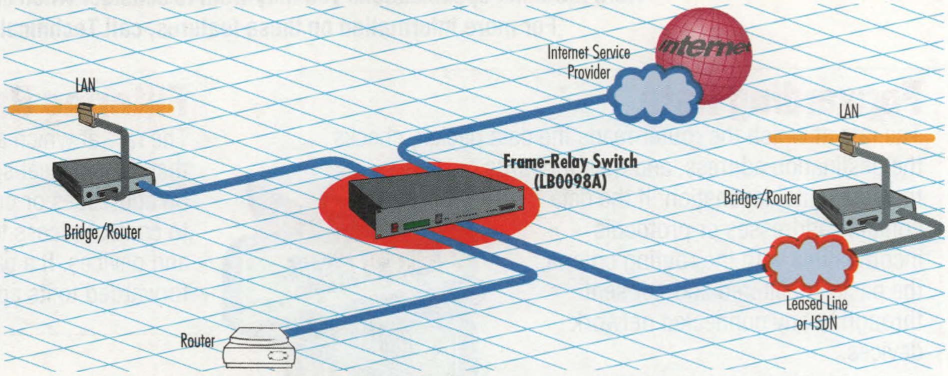
Or if You Prefer:
Fax Us at: 412-746-0746.
E-mail Us at: info@blackbox.com

▷ Remote Token Ring
▷ Local Token Ring
▷ More LAN

Frame-Relay Switches

Expand Your WAN with Frame Relay. Save the Cost of Multiple Lines!

- **Link up to eight leased lines per unit to the public Frame-Relay network—and watch your monthly service charges plummet!**
- **Build private Frame-Relay networks using leased lines.**
- **Extend Frame Relay to users outside the service area.**
- **Multiple V.35, X.21, or RS-232 interfaces to Frame Relay.**
- **Available in 4- or 8-port models. The 4-port unit is expandable.**



Provide network security by logically splitting out or separating Internet and corporate LAN traffic.

Now there's a cost-effective way to expand your WAN—simply and efficiently. You can do it with the BLACK BOX® Frame-Relay Switches.

All it takes is a little concentration…

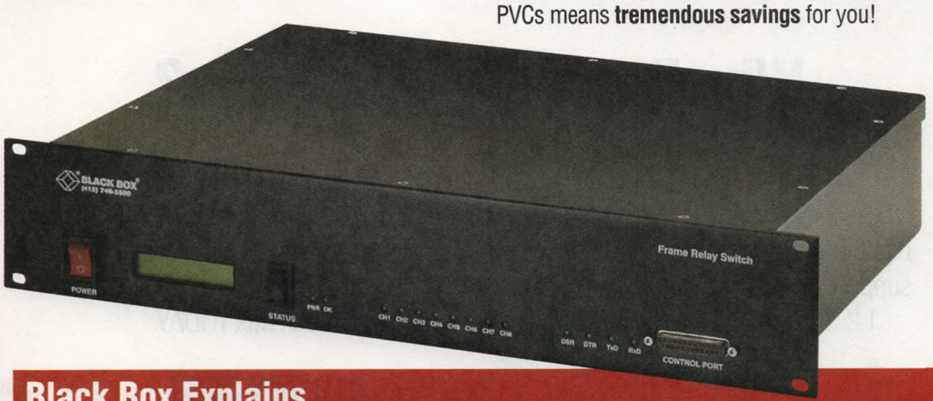
Link up to eight leased lines to the public Frame-Relay network! Your Frame-Relay devices outside the carrier's service area—such as bridges, routers, and FRADs—can become part of the entire Frame-Relay network! You can give these devices leased-line connections to the attached Frame-Relay Switch—they will then operate as though they were on the Frame-Relay network.

…the ability to grow…

You can also use a single Frame-Relay Switch or multiple-cascaded Switches to build a private Frame-Relay network using existing leased lines! Get any-to-any connectivity with a reduced equipment count. When you're ready to switch to a public Frame-Relay service, all the equipment's in place for a smooth transition.

…and your willingness to share and save.

Our Switches enable multiple Frame-Relay devices to share a single PVC of the public Frame-Relay network so you don't have to lease a PVC for each device. The reduction of leased PVCs means **tremendous savings** for you!



SPECIFICATIONS

Ports — Support direct connection to a bridge (DTE) or WAN line (DCE); even ports are DTE, odd ports are hardware/software-configurable for DCE or DTE

Speed — 9.6 Kbps to 2.048 Mbps

CE Approval — All items listed are approved

Interface — V.35

Connectors — (1) DB25 female for serial control port (2400 bps to 19.2 Kbps), (1) DB25 male for each WAN interface

Power — 95–250 VAC, 50–60 Hz

Size — 3.5"H x 19"W x 14"D (8.9 x 48.3 x 35.6 cm)

Weight — 11 lb. (5 kg)

FAXBACK INFORMATION
Request Document Number: 16885
Call 412-746-5500 Anytime

Item	Code	Price
Frame-Relay Switches		
4-Port	LB0098A	**$5995.00**
8-Port	LB0099A	**$6995.00**
4-Port Expansion Card	LB0098C	**$1000.00**
remember to order cables DB25 to V.35 Cable	LB0099A-CBL	**$130.00**

Black Box Explains…

The Frame-Relay Advantage.

American corporations are catching on to a European secret: the Frame-Relay Advantage. In Europe, this packet-switching network is used more than any other kind of remote LAN-to-LAN connection. And no wonder: Frame Relay is unrivaled for value, bandwidth, and flexible multipoint capability.

Value

Like phone service, Frame Relay is usage-sensitive. If you have a traditional leased line, you pay for full-time access to the limited bandwidth of a single line. But with Frame Relay, you pay only for the time you actually use on a large packet-switching network. Not only is your final bill likely to be lower, but you also get access to multiple lines and almost unlimited bandwidth.

Bandwidth-on-Demand

When you send more data across Frame Relay, you get the extra bandwidth you need—instantly.

Flexibility

LANs in many different sites can exchange information with each other, without the expense of multiple leased lines. And when you add new sites, they're easy to connect.

Reduced Hardware Requirements

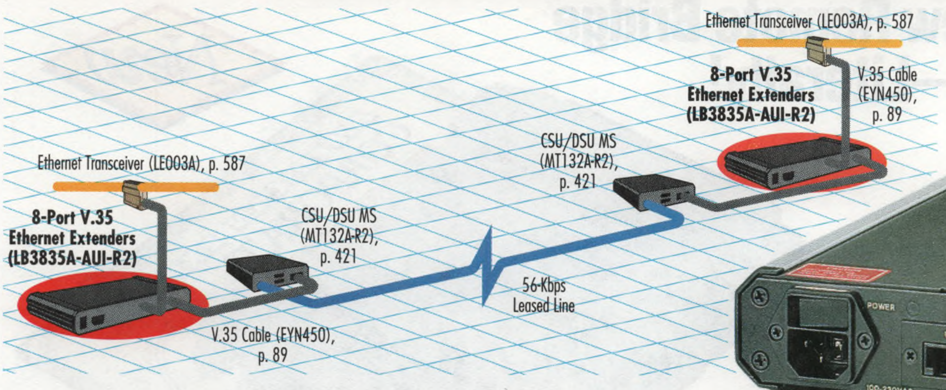
With Frame Relay, you only need one bridge or router at each site. Even central sites connecting to multiple LANs require only one unit. That's a substantial savings in hardware!

PLUS! Black Box Explains: Frame Relay, **see pp. 442–443.**

Ethernet Extenders

Now, Link up to 80 Remote LAN Users.

PLUS! CSU/DSUs, **see pp. 420–424, 435–438.**



POWER
UTP
100-230VAC
TX RX GND
POWER
UTP
TO V.35 LINE
100-230VAC

Top: LB3104A-BT-R2;
Bottom: LB3135A-BT-R2

- **Economical bridging for up to *80* workstations!**
- **Supports Sync or Async.**
- **Management via ASCII terminal or SNMP.**
- **Full security with dialback, password, or time-of-day access.**
- **4-wire models establish a direct link without a modem.**
- **Protocol-transparent.**
- **Set up like MAC-layer bridges.**
- **Fast speed—115.2 Kbps async, or 512 Kbps sync.**

You don't need the expense of a full-sized bridge when you have just one or a few workstations at a remote location. BLACK BOX® Ethernet Extenders now have added features for even more bridging capability so you can use a pair of them to connect a single remote workstation or a workgroup of up to 80 users *without* the expense of a full-sized bridge.

The Ethernet Extenders set up like any MAC-layer bridge—just run two Ethernet Extenders, one at your LAN and the other at your remote site. You need a CSU/DSU for each V.35 Extender or two modems for the RS-232 Extenders. The 4-wire models operate over a direct link on an unshielded twisted-pair cable without the need for modems or CSU/DSUs.

Once they're hooked up, the Extenders automatically learn and store all the node addresses—no programming needed.

The Extenders are protocol-transparent and work with all networks. Operation is completely transparent to high-level protocols like TCP/IP, DECnet™, XNS, and ISO, as well as operating systems like NetWare®, 3Com®, and VINES™.

> ***"I thought I needed a full-sized Ethernet bridge, but when I spoke with Tech Support, I found that an Ethernet Extender would do the job and save money, too."***

SPECIFICATIONS

Protocol — All models: LAN: Independent; WAN: HDLC-based
Speed — All models: LAN: 10 Mbps;
WAN: LB3104A-R2, LB3804A-R2: Up to 768 Kbps;
LB3124A-R2, LB3824A-R2: Up to 64 Kbps;
LB3135A-R2, LB3136A-R2, LB3835A-R2, LB3836A-R2: Up to 512 Kbps
CE Approval — All items listed are approved
Connectors — All models: (1) RJ-45 Control port;
WAN: LB3104A-R2, LB3804A-R2: (1) 5-screw terminal block;
LB3124A-R2, LB3824A-R2: (1) DB25 female;
LB3135A-R2, LB3835A-R2: (1) 34-pin M-block female;
LB3136A-R2, LB3836A-R2: (1) DB37 (RS-422/V.36) female;
LAN: (1) DB15 AUI female, or (1) BNC, or (1) RJ-45, depending on the model
Indicators — (6) LEDs: Power, LAN, LINK, DATA TX, DATA RX, Ready
Power — 115–260 VAC, 50–60 Hz autosensing
Size — 1.8"H x 8.5"W x 11.8"D (4.6 x 21.6 x 29.9 cm)
Weight — 4.2 lb. (1.9 kg)

FAXBACK INFORMATION
Request Document Number: 11787
Call 412-746-5500 Anytime

BUYER'S GUIDE

COMPARISON CHART FOR ETHERNET EXTENDERS

Models	WAN Port	LAN Port	Code	Price
1 Workstation	4-Wire	AUI	LB3104A-AUI-R2	$1100.00
		BNC	LB3104A-BNC-R2	
		10BASE-T	LB3104A-BT-R2	
	RS-232	AUI	LB3124A-AUI-R2	$1100.00
		BNC	LB3124A-BNC-R2	
		10BASE-T	LB3124A-BT-R2	
	V.35	AUI	LB3135A-AUI-R2	$1100.00
		BNC	LB3135A-BNC-R2	
		10BASE-T	LB3135A-BT-R2	
	V.36/RS-422	AUI	LB3136A-AUI-R2	$1100.00
		BNC	LB3136A-BNC-R2	
		10BASE-T	LB3136A-BT-R2	
Up to 80 Workstations	4-Wire	AUI	LB3804A-AUI-R2	$1250.00
		BNC	LB3804A-BNC-R2	
		10BASE-T	LB3804A-BT-R2	
	RS-232	AUI	LB3824A-AUI-R2	$1250.00
		BNC	LB3824A-BNC-R2	
		10BASE-T	LB3824A-BT-R2	
	V.35	AUI	LB3835A-AUI-R2	$1250.00
		BNC	LB3835A-BNC-R2	
		10BASE-T	LB3835A-BT-R2	
	V.36/RS-422	AUI	LB3836A-AUI-R2	$1250.00
		BNC	LB3836A-BNC-R2	
		10BASE-T	LB3836A-BT-R2	

remember to order **cables**

Cable	Code	Price
RS-232 Cable, 10-ft. (3.0-m)	ECM25C-0010	$23.95
For other lengths, see pp. 83 and 123.		
V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	$83.95
For other lengths or genders, see p. 89.		

Remote MiniBridge

Put This Powerful New Remote Bridge on Your Credit Card—Literally!

- **Incredibly compact, yet fully compatible with IEEE 802.3/Ethernet V.2.**
- **High-performance bridge supports full- or half-duplex communication.**
- **Sustains WAN link rates up to 10 Mbps sync or 115.2 Kbps async.**
- **LAN table automatically learns up to 10,000 addresses.**
- **Automatic aging simplifies management by keeping the address table current.**
- **Choose from two models to support AUI or UTP LAN connections.**
- **Models available with RS-232, V.35, RS-422, RS-530, or X.21.**

BLACK BOX
(412) 746-5500
Remote
Mini Bridge
WAN
LAN
COLL
PWR
SQE
FILTER
COMPR
ASYNC
ON
AMERICAN EXPRESS
CORPORATE

New

PLUS! CSU/DSUs, see pp. 420–424, 435–438.

Talk about tiny! If our new compact Remote MiniBridge was any smaller, you could carry it in your wallet! As it is, this palm-sized powerhouse packs all the performance you need to support full IEEE 802.3 connectivity between remote LAN segments. All you have to do is plug it in!

It configures easily with just four front-panel DIP switches. Once plugged in and powered on, it instantly begins learning the MAC-layer addresses of each node on its segment. Then it goes to work, reducing your overall network traffic by only forwarding packets bound for other segments.

Available in two models to support AUI or UTP LAN ports, the Remote MiniBridge simply plugs into your network hub or switch. Attach the WAN port to a DCE such as a CSU/DSU or multiplexor and you've completed your remote connection.

You can even use a pair of Remote MiniBridges to simply extend or segment your existing LAN—two ingenious ways to improve the performance of your campus network.

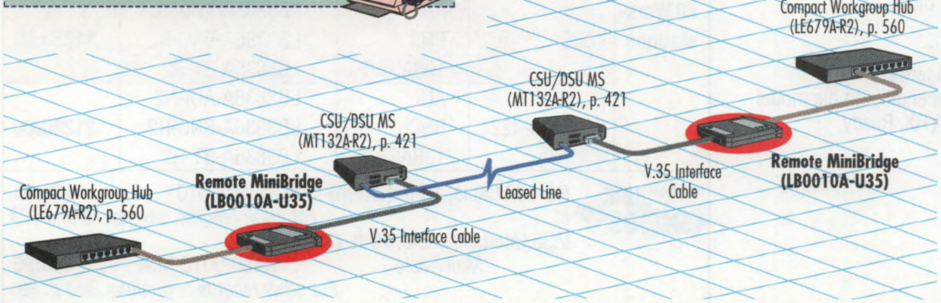
Filtering and forwarding rates of 14,880 packets per second (pps) approach the theoretical maximum wire-speed threshold of 15,000 pps, so you won't find a much faster bridge than this one.

To further support maximum data rates, the internal buffer holds up to 256 frames with a throughput latency of just one frame.

The comprehensive front-panel LED display conveniently indicates LAN and WAN port activity as well as power (PWR) and collisions (COL). Four easy-to-set DIP switches are also present on the front of each MiniBridge to help you configure the parameters you need, so you can get to work as quickly as possible.

Considering all that, the new Remote MiniBridge is *truly* a remarkable addition to the Black Box family of remote bridges. It's a great, affordable way to maintain the high-speed, long-distance LAN connections your business demands—and just one more reason why Black Box is *The World's Source for Connectivity℠*.

FAXBACK INFORMATION
Request Document Number: 17817
Call 412-746-5500 Anytime


Compact Workgroup Hub (LE679A-R2), p. 560
Remote MiniBridge (LB0010A-U35)
CSU/DSU MS (MT132A-R2), p. 421
V.35 Interface Cable
Leased Line
CSU/DSU MS (MT132A-R2), p. 421
V.35 Interface Cable
Remote MiniBridge (LB0010A-U35)
Compact Workgroup Hub (LE679A-R2), p. 560

SPECIFICATIONS

Buffer — 256 frames
Filtering and Forwarding Rate — 14,880 pps
Speed — WAN: Up to 10 Mbps sync, 115.2 Kbps async; LAN: 10 Mbps
Standards — IEEE 802.3/Ethernet v.2; 10BASE5 or 10BASE-T
CE Approval — All items listed are approved
Interface — WAN: RS-232/X.21/V.35/RS-530; LAN: AUI or UTP
Connectors — WAN: All: (1) DB25 female; LAN: LB0010A-A35: (1) DB15 male; LB0010A-U35: (1) RJ-45
Indicators — (4) LEDs: WAN, LAN, COLL, PWR
Power — All: External 115-VAC to 12 VDC transformer (230-VAC versions on request); LB0010A-A35: May also be powered directly from the AUI interface
Size — 0.7"H x 2.1"W x 2.7"D (1.8 x 5.3 x 6.9 cm)
Weight — 0.1 lb. (<0.1 kg)

Item			**Code**	**Price**
Remote MiniBridge				
	AUI	RS-232	LB0010A-A24	**$530.00**
		V.35	LB0010A-A35	**$530.00**
		RS-422	LB0010A-A36	**$530.00**
		RS-530	LB0010A-A53	**$530.00**
		X.21	LB0010A-A21	**$530.00**
	UTP	RS-232	LB0010A-U24	**$530.00**
		V.35	LB0010A-U35	**$530.00**
		RS-422	LB0010A-U36	**$530.00**
		RS-530	LB0010A-U53	**$530.00**
		X.21	LB0010A-U21	**$530.00**
Ethernet Transceiver Office Cable, 10-ft. (3.0-m)				
		PVC	LCN210-0010	**$51.95**
Category 5 Color Patch Cable (Beige)				
	10-ft. (3.0-m)		EVMSL05-0010	**$10.95**

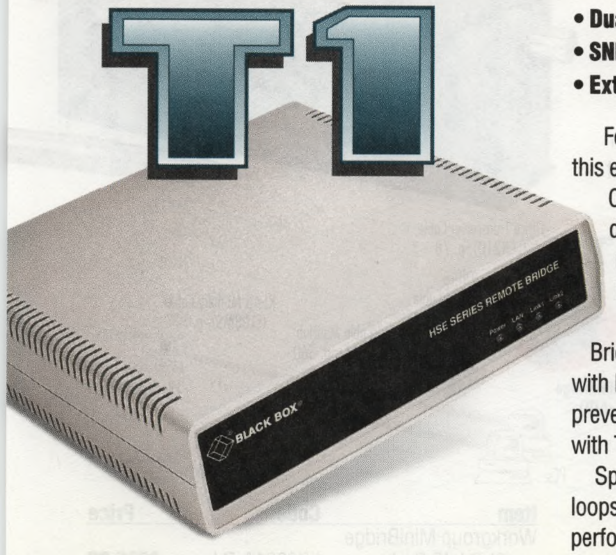
remember to order cables

For other lengths, see p. 78.

For other lengths and colors, see p. 69.

High-Speed T1 Bridges

Great Performance. Great Price. A Great High-Speed T1 Bridge.



- **Dual-link speed to 4-Mbps aggregate.**
- **SNMP management.**
- **Extra fault tolerance.**

For single- or dual-link load-sharing, this economical Bridge performs!

Communicate with *and* control all attached devices in the network with its on-board menu management system. Manage LAN and Link stats, and run diagnostics.

There's also an SNMP agent on each Bridge. You can reduce your line charges with Bandwidth-on-Demand. *And* you can prevent congestion on the wide-area link with Traffic Management.

Spanning Tree Protocol detects and eliminates loops—*and* supplies backup data paths. That's performance!

SPECIFICATIONS

Speed — Aggregate up to 4 Mbps;
Filtering rate: 17,500 packets/second
CE Approval — All items listed are approved except MT100A-35-R2
Connectors — (1) DB9 male console port;
LAN: (1) DB15 AUI female and (1) BNC female or (1) RJ-45 female;
WAN: (2) DB25 female; DB25 to V.35 adapter included
Indicators — (4): Power, LAN, Link 1, Link 2
Power — 115–230 VAC, 50–60 Hz
Size — 2"H x 10"W x 10"D (5.1 x 25.4 x 25.4 cm)
Weight — 15 lb. (6.8 kg)

Item	**Code**	**Price**
High-Speed T1 Bridges		
AUI/BNC Single-Link	LB3235A-R3	**$3345.00**
Dual-Link	LB4235A-R3	**$4835.00**
AUI/10BT Single-Link	LB3236A-R3	**$3345.00**
Dual-Link	LB4236A-R3	**$4845.00**
To connect your Bridge, you will also need…		
T1 CSU/DSU (**p. 436**)	MT100A-35-R2	**$1295.00**
remember to order cables V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

For other lengths or genders, see p. 89.

Pocket Workgroup Bridge

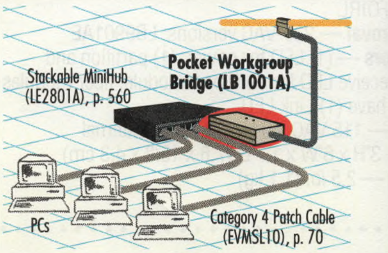
All the Power of a Full-Sized Bridge in One Tiny Package!

- **Inexpensive enough to fit within your budget.**
- **Compact enough to hold in your palm.**

It's the fastest, lowest-cost Ethernet Bridge available today—in a palm-size package. It's compact, yet it performs like a full-size, unmanaged Bridge.

Segment your LAN or attach a workgroup in 30 seconds—just plug it in! It learns address nodes, aging, and new configurations *instantly*. This Bridge has two AUI ports: one male, which plugs into an AUI hub or repeater port, and one female for external transceiver connections. You don't have to locate an AC outlet (**see diagram**).

A proprietary microprocessor enables filtering and forwarding at 14,880 packets per second for up to 256 nodes. That's full wire-speed bridging for less than $500!


Stackable MiniHub (LE2801A), p. 560
Pocket Workgroup Bridge (LB1001A)
PCs
Category 4 Patch Cable (EVMSL10), p. 70

BLACK BOX®
Pocket Workgroup Bridge
WORKGROUP
DATA
BACKBONE

SPECIFICATIONS

Filtering/Forwarding Rate —
Up to 14,880 packets per second
Filter Size — Up to 256 workgroup nodes
CE Approval — Yes
Power — From the AUI interface;
250 mA @ 9–16 VDC typical
Size — 0.8"H x 4.2"W x 2"D (2 x 10.7 x 5.1 cm)
Weight — 0.3 lb. (0.1 kg)

Item	**Code**	**Price**
Pocket Workgroup Bridge	LB1001A	**$499.00**
remember to order cables Ethernet Office Transceiver Cable, 10-ft. (3.0-m) PVC	LCN210-0010	**$51.95**

For other lengths, see p. 78.

Local Ethernet Bridges

Link Two Local LANs with This Protocol-Transparent, Fault-Tolerant Local Bridge.

Now Supports Telnet™!
ELS SERIES LOCAL BRIDGE
BLACK BOX®

- **Link two LAN segments into a single logical network.**
- **Big-bridge capacity.**
- **Better network performance.**
- **Spanning Tree Protocol.**

No matter how big you plan to build, this dual-port, MAC-layer Bridge can handle as many addresses as you can build into your LAN (up to 16,000!). And if you've reached the maximum repeater count on your Ethernet segment, just install this Bridge and start the repeater count all over again.

The Bridge automatically learns the addresses of all devices on both networks and builds separate tables for each network. Then it compares destination addresses with these tables and decides how to route each packet. This reduces overall traffic on the network and cuts response times. And since these Bridges are protocol-transparent, they support any Ethernet cabling system running any network operating system.

SPECIFICATIONS

Speed — 10 Mbps; Filter rate: 17,500 pps;
forwarding rate: 11,000 pps
CE Approval — All items listed are approved
Connectors — All: (2) DB15 AUI female,
(1) DB9 male console port;
LB1202A: (2) BNC; LB1210A: (2) RJ-45 female;
LB1212A: (1) BNC, (1) RJ-45 female
Power — 115–230 VAC, 50–60 Hz, autosensing
Size — 2.8"H x 9.6"W x 10"D (5.1 x 24.4 x 30.5 cm)
Weight — 11 lb. (5 kg)

FAXBACK INFORMATION
Request Document Number: 11550
Call 412-746-5500 Anytime

Item	**Code**	**Price**
Local Ethernet Bridges		
Dual 10BASE2	LB1202A-R2	**$1995.00**
Dual 10BASE-T	LB1210A-R2	**$1995.00**
10BASE2 and 10BASE-T	LB1212A-R2	**$1995.00**

Remote Token Ring
Local Token Ring
More LAN

Wire-Speed
Workgroup MiniBridge
BLACK BOX (412) 746-5500

Workgroup MiniBridge

Break Up the Traffic Jam in Your Workgroup—Get Your LAN Moving Again.

- **Instantly frees up network bandwidth.**
- **Filters out unneeded traffic.**
- **Plug-and-play installation and operation.**
- **Software-transparent.**
- **Supports server-based workgroups—from 4 to 256 nodes.**
- **Mix and match Ethernet media.**

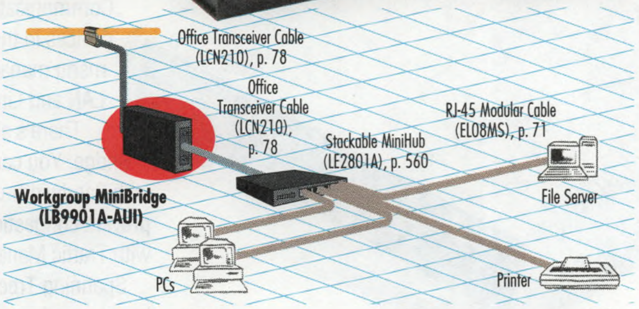
If your workgroup has become slow and congested, our MiniBridge gets traffic moving again. It bridges between the workgroup and the central network, filtering out extra central network traffic that causes congestion.

And because it's so compact, you can do a hotspot analysis almost anywhere. Just insert the MiniBridge into any segment to relieve bottlenecks.

Like all MAC-layer bridges, this one automatically learns node addresses, so no software setup is required. Operation is completely transparent, so there's no effect on any software applications or LAN management platforms.

The MiniBridge supports server-based workgroups of 4 to 256 nodes. Models are available for any network media: 10BASE-T, 10BASE5, 10BASE2, and 10BASE-FL/FOIRL.

FAXBACK INFORMATION
Request Document Number: 13882
Call 412-746-5500 Anytime


Office Transceiver Cable (LCN210), p. 78
Office Transceiver Cable (LCN210), p. 78
Stackable MiniHub (LE2801A), p. 560
RJ-45 Modular Cable (EL08MS), p. 71
File Server
Workgroup MiniBridge (LB9901A-AUI)
PCs
Printer

SPECIFICATIONS

Filtering and Forwarding — 14,880 pps

Speed — 10 Mbps

Standards — Ethernet Ver.1.0-2.0 IEEE 802.3: 10BASE-T, 10BASE5, 10BASE2, 10BASE-FL and FOIRL

CE Approval — 230-VAC versions: LB9901AE

Indicators — (1) LED for power; (1) partition and (1) receive LED for each port module; fiber modules also have (1) Link LED

Power — 115 VAC, 60 Hz, 12 watts, external

Size — 3"H x 6"W x 1.7"D (7.6 x 15.2 x 4.3 cm)

Weight — 2.5 lb. (1.1 kg)

Item	Code	Price
Workgroup MiniBridge		
(2) RJ-45 Ports	LB9901A-RJ	**$795.00**
(2) BNC Ports	LB9901A-BNC	**$795.00**
(2) AUI Ports	LB9901A-AUI	**$750.00**
(1) TP, (1) Fiber Port	LB9901A-TST	**$945.00**
(1) AUI, (1) Fiber Port	LB9901A-AST	**$895.00**
remember to order cables: Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		
Ethernet Transceiver Cable, 10-ft. (3.0-m)	LCN210-0010	**$51.95**
ThinNet Cable, 10-ft. (3.0-m)	LCN300-0010	**$17.95**
For other lengths, see pp. 77–78.		

◆ ◆ ◆

Ethernet to Token Ring Bridge

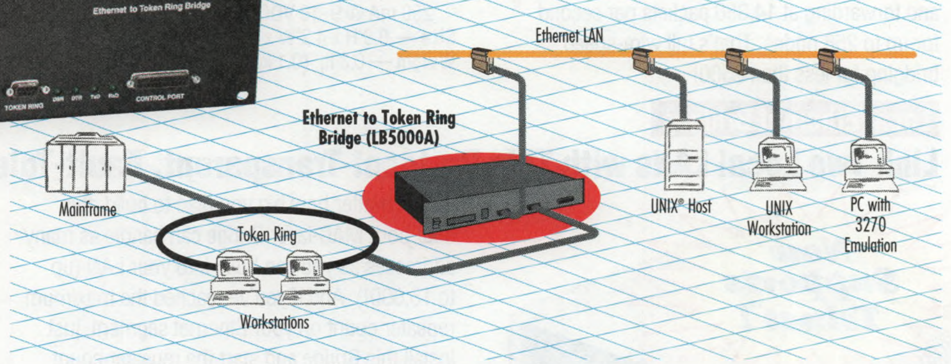
At Last—Transparent Connections between Token Ring and Ethernet LANs!

Ethernet to Token Ring Bridge
BLACK BOX (412) 746-5500
POWER
STATUS
ETHERNET
TOKEN RING
CONTROL PORT

- **Looks like a source-routing bridge to a Token Ring LAN and as a native Ethernet device on an Ethernet LAN.**
- **Enables Ethernet to Token Ring connection without having to change either LAN protocol.**
- **Uses existing LAN management software.**

Now you can link dissimilar LANs transparently, with the Ethernet to Token Ring Bridge!

The Bridge's simple configuration enables communications between Ethernet and Token Ring workstations. Management is achieved in band or serially out of band using its DOS or Windows® Bridge Manager Program. Status reports are received via IBM® LAN Manager—so you save by using existing IBM software.


Ethernet LAN
Ethernet to Token Ring Bridge (LB5000A)
Mainframe
Token Ring
Workstations
UNIX® Host
UNIX Workstation
PC with 3270 Emulation

SPECIFICATIONS

Speed — 4- and 16-Mbps Token Ring; 10-Mbps Ethernet interface

CE Approval — Yes

Connectors — (1) DB9 for Token Ring port, (1) DB25 for serial control port, (1) DB15 AUI for 10BASE5 thick Ethernet (compatible with external transceiver for 10BASE2 Thin Ethernet and 10BASE-T)

Power — 115–230 VAC, 50–60 Hz

Size — 3.5"H x 19"W x 14"D (6.4 x 48.3 x 35.6 cm)

Weight — 14 lb. (6.4 kg)

FAXBACK INFORMATION
Request Document Number: 17044
Call 412-746-5500 Anytime

Item	Code	Price
Ethernet to Token Ring Bridge	LB5000A	**$4395.00**
remember to order cables: Token Ring Adapter Cable, Type 1 Custom Lengths	EVNTRD9	**$32.30 + $.48/ft.**
For specific lengths, see p. 80.		

Frame-Relay Token Ring Bridges

Finally—Frame Relay for Token Ring!

- **Save by using Frame Relay instead of leased lines.**
- **LAN Network Manager and NetView® Bridge Management compatible.**
- **100% IBM® compatible. Support either point-to-point or Frame-Relay operation.**
- **Change topologies without changing bridges.**
- **Workgroup model offers a low-cost, compact integrated Bridge/MAU.**

You asked for it—now your Token Ring network can take advantage of Frame Relay! With Frame Relay, internetworking costs are lower. You can get multiple logical connections over a single physical connection, which means equipment and access costs less. *Plus* performance is better, network access is increased, and your network is less complex. And Frame Relay provides a natural migration path to ATM because it uses the same network topology.

All our Frame-Relay Token Ring Bridges support point-to-point or Frame Relay so you can change topologies without changing Bridges.

Choose optional Management Software for full IBM and SNMP compliance. All feature in-band and out-of-band management so you can configure all your Bridges from a single site—no on-site expertise needed. And we have a Bridge for every installation:

High Speed—The High-Speed Token Ring Bridge gives you up to 2.048-Mbps transmission. Dual WAN ports protect you from a failed WAN link, or handle extra traffic.

Rackmount—This low-profile model handles speeds up to 512 Kbps, and has a space-saving internal power supply and LCD diagnostics for on-site management.

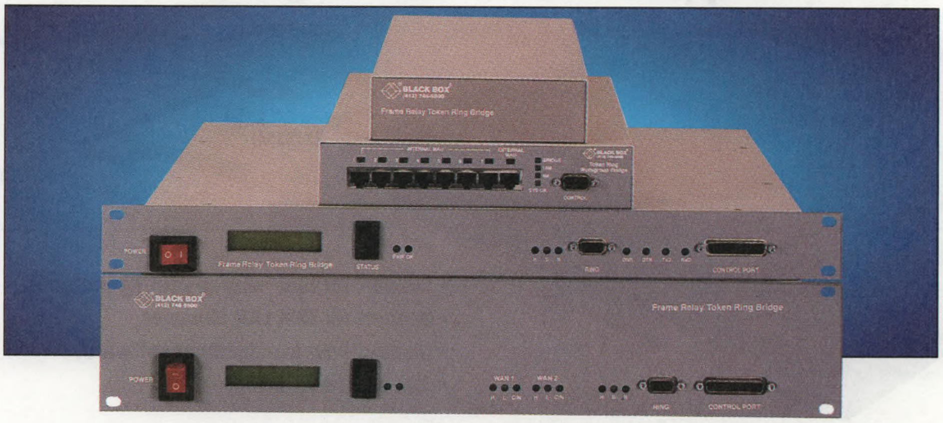
Standalone—This basic Token Ring Bridge provides speeds up to 512 Kbps in a neat, desktop format. This Bridge is great for sites that will be managed remotely.

Card—This interface-powered version of the Standalone Bridge fits in two ISA 16-bit expansion slots. It draws power from the PC I/O bus.

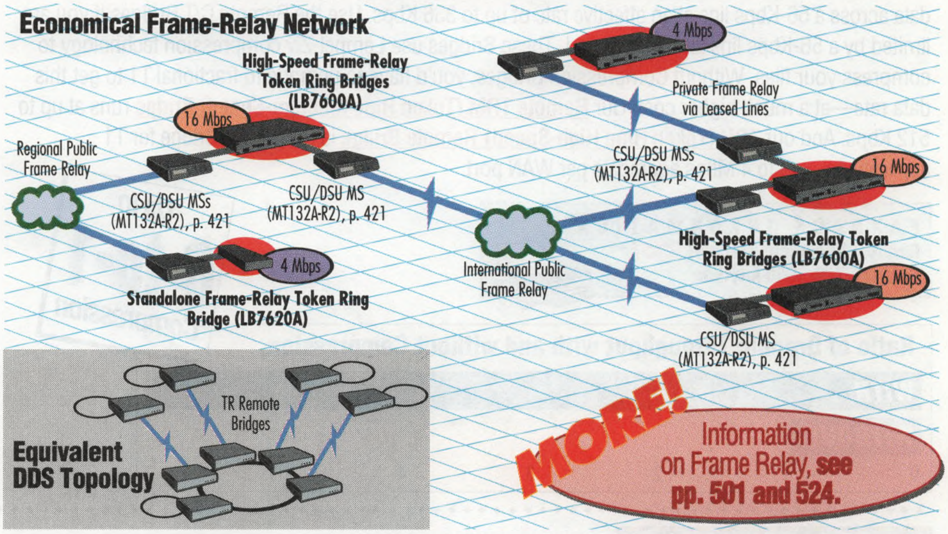
One-of-a-Kind Workgroup Bridge

EXCLUSIVE

Our Workgroup Frame-Relay Token Ring Bridge adds a 7-Port MAU to the Bridge. The result: both a Bridge and a MAU at far lower cost than if you bought them separately. And this Bridge takes the space of only one piece of equipment. The MAU ports have automatic speed-detect and lock-out—workstations set at the wrong LAN speed can't enter the LAN.


BLACK BOX
Frame Relay Token Ring Bridge
POWER
STATUS
RING
CONTROL PORT
WAN 1
WAN 2

Pictured top to bottom: LB7620A, LB7630A, LB7610A, LB7600A


Economical Frame-Relay Network
High-Speed Frame-Relay Token Ring Bridges (LB7600A)
16 Mbps
Regional Public Frame Relay
CSU/DSU MSs (MT132A-R2), p. 421
CSU/DSU MS (MT132A-R2), p. 421
4 Mbps
Standalone Frame-Relay Token Ring Bridge (LB7620A)
4 Mbps
Private Frame Relay via Leased Lines
CSU/DSU MSs (MT132A-R2), p. 421
16 Mbps
International Public Frame Relay
High-Speed Frame-Relay Token Ring Bridges (LB7600A)
16 Mbps
CSU/DSU MS (MT132A-R2), p. 421
TR Remote Bridges
Equivalent DDS Topology

MORE! Information on Frame Relay, see pp. 501 and 524.

SPECIFICATIONS

Speed — LB7600A: 9.6 Kbps to 2.048 Mbps; LB7610A, LB7620A, LB7620C, LB7630A: 9.6 to 512 Kbps

Standards — IEEE 802.5 source-routing Token Ring Access Method, IEEE 802.2 Logical Link Control (LLC), SNMP

CE Approval — All items listed are approved

Connectors — LB7600A: (1) DB9 female, (2) DB25 male, (1) DB25 female; LB7610A: (1) DB9 female, (1) DB37 female, (1) DB25 female; LB7620A, LB7620C: (1) DB9 female, (1) DB25 male, (1) DB9 male; LB7630A: (8) RJ-45 MAU ports, (1) DB9 male, (1) DB25 male

Indicators — LB7600: (1) Power, (1) System Status, (3) Token Ring Status; LB7610A: (1) Power, (1) System Status, (3) Token Ring Status; (4) Control Port Status; LB7620A, LB7620C: (1) System Status, (1) Token Ring Status; LB7630A: (1) System Status, (2) Token Ring Speed, (8) MAU Status

Power — LB7600A, LB7610A: Internal 115/230 VAC, 60/50 Hz, autoswitching; LB7620A, LB7630A: External 115/230 VAC, 60/50 Hz, autoswitching; LB7620C: From the interface;

Size — LB7600A: 3.5"H x 19"W x 14"D (8.9 x 48.3 x 35.6 cm); LB7610A: 1.8"H x 19"W x 14"D (4.4 x 48.3 x 35.6 cm); LB7620A: 1.8"H x 13.8"W x 5.7"D (4.5 x 35.1 x 14.5 cm); LB7620C: Dual Card; LB7630A: 1.7"H x 13.2"W x 8.3"D (4.3 x 33.5 x 21 cm)

Weight — LB7600A: 14 lb. (6.4 kg); LB7610A: 7.3 lb. (3.3 kg); LB7620A: 2.7 lb. (1.3 kg); LB7620C: 1.3 lb. (0.6 kg); LB7630A: 5 lb. (2.3 kg)

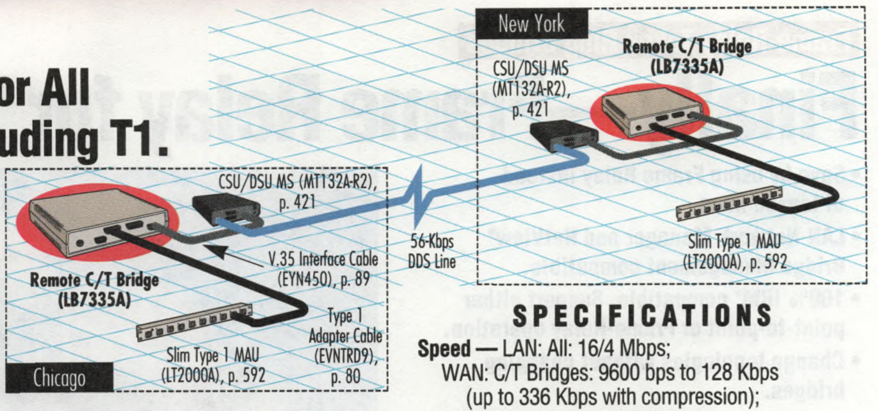
FAXBACK INFORMATION
Request Document Number: 15334
Call 412-746-5500 Anytime

Item	**Code**	**Price**
Frame-Relay Token Ring Bridges		
High-Speed	LB7600A	**$5995.00**
Rackmount	LB7610A	**$4195.00**
Standalone	LB7620A	**$2695.00**
Card	LB7620C	**$2195.00**
Workgroup	LB7630A	**$3395.00**
Bridge-Management Software		
DOS	LB7601	**$495.00**
Windows®	LB7602	**$595.00**

Remote Token Ring Bridges

The Source-Routing Bridges for All Your WAN Applications—Including T1.

C/T SERIES REMOTE BRIDGE
Power LAN Link1 Link2
BLACK BOX

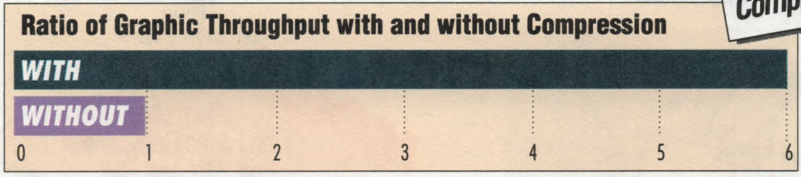

New York
CSU/DSU MS (MT132A-R2), p. 421
Remote C/T Bridge (LB7335A)
Slim Type 1 MAU (LT2000A), p. 592
56-Kbps DDS Line
CSU/DSU MS (MT132A-R2), p. 421
V.35 Interface Cable (EYN450), p. 89
Remote C/T Bridge (LB7335A)
Type 1 Adapter Cable (EVNTRD9), p. 80
Slim Type 1 MAU (LT2000A), p. 592
Chicago

- **Support for IBM® source-routing protocol.**
- **Support for IBM LAN Manager.**
- **Menu-driven management software.**
- ***You* set the filtering.**

Choose from three proven performers. Our Remote C/T (Compression Token Ring) Bridge sends data across a 56-Kbps line at an effective rate of up to 336 Kbps. Use the Remote C/T Bridges if you are limited by a 56-Kbps line and need speed. These Bridges use Lempel-Ziv compression technology to compress your files. Without Compression Bridges, you'd have to upgrade to fractional T1 to get this data rate—at a much higher cost. Our Remote TRM (Token Ring Medium-Speed) Bridge runs at up to 512 Kbps. And our TRH (Token Ring High-Speed) Remote Bridge is the perfect Bridge for T1 applications—up to 4 Mbps aggregate per WAN port.

FAXBACK INFORMATION
Request Document Number: 11567
Call 412-746-5500 Anytime

Up to 6-to-1 Compression



SPECIFICATIONS

Speed — LAN: All: 16/4 Mbps;
WAN: C/T Bridges: 9600 bps to 128 Kbps (up to 336 Kbps with compression);
TRM Bridges: Up to 512 Kbps;
TRH Bridges: Up to 4 Mbps

Standards — IEEE 802.5, source-routing, SNMP, V.35

CE Approval — All items listed are approved, except MT132A-R2

Connectors — C/T Bridges: RS-232 Console Port: (1) DB9 male; LAN: (1) DB9 female;
WAN: (1) or (2) DB25 female;
TRM and TRH Bridges: RS-232 Console Port: (1) DB9 male; LAN: (1) DB9 female;
WAN: (2) DB25 female

Power — 100–250 VAC, 60–50 Hz, autosensing

Size — 2"H x 10"W x 10"D (5.1 x 25.4 x 25.4 cm)

Weight — 11 lb. (5 kg)

Item	**Code**	**Price**
Remote C/T Bridge (with Compression)		
SLB	LB7335A	**$4150.00**
DLB	LB7435A	**$5650.00**
Remote TRM Bridge (without Compression)		
SLM	LB7135A-R2	**$3650.00**
DLM	LB7235A-R2	**$5150.00**
TRH Remote Bridge (for T1 Applications)		
SLM V.35	LB8135A-R2	**$4550.00**
DLM V.35	LB8235A-R3	**$6050.00**
You may also need...		
CSU/DSU MS (**p. 421**)	MT132A-R2	**$725.00**
V.35 Interface Cable, 10-ft. (3.0-m) Male/Male	EYN450-0010-MM	**$83.95**

For other lengths or genders, see p. 89.

◆ ◆ ◆

Local Token Ring Bridges

Boost Your Local Token Ring Performance.

- **Isolate LAN segments and cut network delay.**
- **Source-Routing or Source-Routing-Transparent operation.**
- **Support for 4- or 16-Mbps operation.**

BLACK BOX
TRM SERIES LOCAL BRIDGE

Choose the Local TRM Bridge for source-routing only.

This Bridge is designed to install quickly and features built-in management and security. The menu-driven management supplies you with network statistics and other performance information.

Or choose the Token Ring Bridge for Source-Routing-Transparent operation.

This local Token Ring Bridge supports source-routing, transparent routing, and Source Routing Transparent (SRT). It's protocol-transparent, so it supports any operating system that runs Token Ring.

SPECIFICATIONS

Protocol — LB7100A: Source-routing only;
LB0003A: Source-routing only, transparent routing only, Source-Routing Transparent (SRT)

Speed — LB7100A: 16/4 Mbps, selectable for each port;
LB0003A: Filtering Rate: 120,000 pps (at 16 Mbps);
Forwarding Rate: 3400 pps (at 16 Mbps)

CE Approval — All items listed are approved

Connectors — LB7100A: LAN: (2) DB9 female;
Management port: (1) DB9 male;
LB0003A: LAN: (2) DB9 female;
Management port: (1) DB25

Power — 115–230 VAC, 50–60 Hz, autosensing

Size — LB7100A: 2"H x 10"W x 10"D (5.1 x 25.4 x 25.4 cm);
LB0003A: 2.2"H x 16.9"W x 13.8"D (5.6 x 43 x 35.1 cm)

Weight — LB7100A: 11 lb. (5 kg);
LB0003A: 10.6 lb. (4.8 kg)

FAXBACK INFORMATION
For Local TRM Bridge: 11361
For Token Ring Bridge: 10377
Call 412-746-5500 Anytime

Item	**Code**	**Price**
Local TRM Bridge	LB7100A	**$3695.00**
Token Ring Bridge	LB0003A	**$3995.00**

Remote Access—Black Box Brings the World of Information Right to Your Fingertips!

The Information Superhighway is calling. Your challenge is to get there—from your home, your office, your car, your hotel room. Black Box has the equipment you need to make those **Remote Access Connections** every day:

Remote Network Access—Whether you're dialing into the home office from a branch site, or calling the main office from your home, Black Box has a range of high-speed options to support the connection you need.

ISDN—It's more affordable than ever and up to four times faster than a V.34 modem—great for linking one PC or an entire LAN. And it's an excellent low-cost dialup option. Need more reasons to consider ISDN? Check out our Black Box Explains (**below**).

Internet Access—Plug your whole office into the Internet with a single connection. BLACK BOX® Terminal Servers (**pages 542–543**) and Internet Access Routers (**page 536**) merge multiple workstations and provide a single-point of access to the Net.

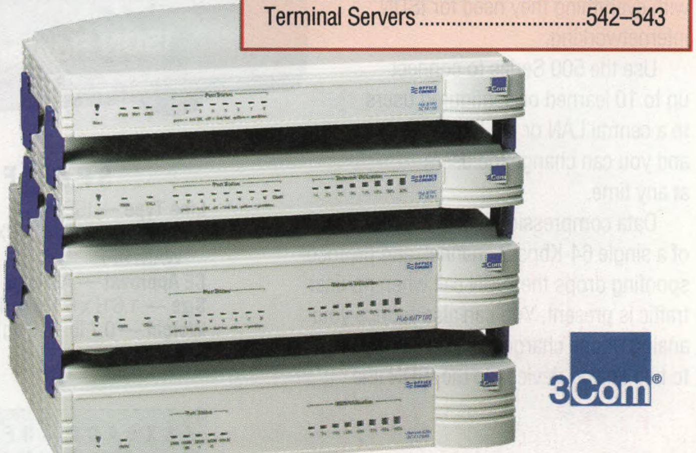
In This Section...

Introduction 531
PC Bridge/Routers 532
ISDN Routers 532–534
Modular Routers 535
Internet Access Routers 536
3Com OfficeConnect Remote 537
3Com Access Builder Family 538
U.S. Robotics NETServers 539
Remote Access Servers 540–541
Terminal Servers 542–543

BLACK BOX SOLUTIONS

> ***"I need ISDN links for a range of remote services, but I'm not sure what equipment will work best to suit my needs. Any ideas?"***

It's difficult finding the right remote solution. Why not give our Expert Technical Support Staff a call? Available 24 hours a day, seven days a week, they'll help you find *exactly* what you need to meet all your remote connectivity needs, like the 3Com® OfficeConnect™ Remote series (see **page 537**). OfficeConnect™ Remote hooks you up with the Internet, gives you the power of ISDN, and enables conventional voice and fax transmissions over the same ISDN line. That makes it perfect for your small offices or branch office. Need to expand even more? Just clip several units together—or combine them with the OfficeConnect™ series (see **page 561**)—to build *exactly* the remote solution you need to help grow your LAN.



*3Com® OfficeConnect and OfficeConnect™ Remote, **see pp. 537 and 561.***

FOR FAST TECH SUPPORT,
Call **412-746-5500**

PRESS **1,2,4** LOCAL AREA NETWORK
High-Speed, Bridges and Routers, **Remote Access**, Wireless, Network Management, Ethernet, Token Ring, NetWare®, AppleTalk®, ARCNET®, CD-ROM

Or if You Prefer:
Fax us at: 412-746-0746.
E-mail us at: info@blackbox.com

Black Box Explains...

Three *Great* Reasons to Consider ISDN:

ISDN Is a Switched Service. 1

That means data connections are temporary, and the ISDN link is active only when you use it. The benefit: After a small monthly fee, you pay only for ISDN calls you make. Dedicated high-speed services, such as T1, charge a high monthly rate even if you don't use them.

ISDN Supports Flexible Connections to Multiple Sites. 2

Just like a telephone line, ISDN lets you dial any location—*anywhere in the world!* Services like DDS or T1 provide a fixed point-to-point connection, with no flexibility to dial other locations. ISDN gives you fast, flexible communications *for a much lower price!*

All-Digital Transmission Means High Performance. 3

High-speed analog modems can suffer data slowdowns from poor telephone-line quality. Since ISDN is an end-to-end digital service, you always have the full bandwidth available for data transmission.

REMOTE ACCESS

500 Series ISDN Routers

Designed for Your Small Office's ISDN Internetworking Needs.

- **Concurrently routes IP and IPX™ while bridging all other protocols.**
- **Automatically connects up to 10 LAN users to a central LAN or the Internet.**
- **Add voice ports to connect voice, fax, and modem devices—and eliminate the need for dedicated analog phone lines.**

ABSOLUTELY GUARANTEED FOR LIFE

New

BLACK BOX®
(412) 746-5500
ISDN Router
Power
LAN
Link 1
Link 2

Our 500 Series ISDN Routers provide small and home offices with everything they need for ISDN internetworking.

Use the 500 Series to connect up to 10 learned or configured users to a central LAN or the Internet—and you can change the users at any time.

Data compression increases the capacity of a single 64-Kbps B channel, and protocol spoofing drops the ISDN call when no user traffic is present. You can also reduce your analog phone charges by connecting up to two analog devices to the ISDN line.

SPECIFICATIONS

Line Type — ISDN
Protocols — LAN: IP, IPX, AppleTalk®; WAN: PPP
CE Approval — All items listed are approved
Size — 1.6"H x 6.1"W x 4.3"D (4 x 15.5 x 11 cm)
Weight — 0.7 lb. (0.3 kg)

FAXBACK INFORMATION
Request Document Number: 19008
Call 412-746-5500 Anytime

Item	Code	Price
500 Series ISDN Routers		
IP with PPP	LR1500A-US	**$695.00**
IP/IPX with PPP, Compression, Spoofing, and NetSAFE	LR1510A-US	**$845.00**
IP/IPX with PPP, Voice, Compression, Spoofing, and NetSAFE	LR1520A-US	**$995.00**
RJ-45 (8-Wire) Modular Cable, 7-ft. (2.1-m) Straight-Pinned	EL08MS-07	**$4.95**

remember to order cables

For other lengths and pinnings, see p. 71.

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PC Bridge/Routers

Make an ISDN Connection to Any LAN from Your PC.

VIPreview
Ask for our **ISDN VIPreview.**

Connect a remote PC easily with this plug-and-play card. No extra hardware—or experts needed.

- **Fast, easy remote LAN access.**
- **Windows® based interface.**
- **Automatic call establishment.**
- **Routes IP and IPX™; bridges all others.**

Plug this intelligent half-size card into your IBM® (or compatible) PC—and automatically connect to a central LAN. Access and transfer files, send print jobs, send and receive e-mail. Password security and filtering protect against unauthorized access.

The PC Bridge/Router senses when data-transfer activity stops. The card terminates the call and "spoofs" the server so the Bridge/Router appears to be still connected. When you want access again, the connection is re-established.

The PC Bridge/Router with Data Compression increases the card's 128-Kbps transfer rate—boosting the volume of data you can send by 6 to 1.

Bandwidth-on-demand enables second ISDN calls during extra traffic periods. And with time-of-day calls, you can schedule calls at any time.

SPECIFICATIONS

Link Speeds — 128 Kbps aggregate
Management — SNMP; transparent link activation/deactivation on time-of-day, IP and/or IPX, and LAN traffic for WAN management
System Requirements — IBM PC or compatible with ISA bus (386SX or greater), 1-MB hard drive, DOS/Microsoft® Windows 3.1 or higher; ISDN BRI (Basic Rate Interface) 2B + D applications with more than 1 PC require an Ethernet NIC running in promiscuous mode
CE Approval — All items listed are approved
Power — From the PC
Size — 4.7"H x 7"D (11.9 x 17.8 cm)
Weight — 2 lb. (0.9 kg)

FAXBACK INFORMATION
Request Document Number: 13899
Call 412-746-5500 Anytime

Item	Code	Price
PC Bridge/Router	LR3000C	**$595.00**
PC Bridge/Router with Data Compression	LR3000C-C	**$995.00**

For more Bridge/Routers, see pages 500–530.

2000 Series ISDN Office Routers

Black Box Introduces the Affordable ISDN Router that's Just the Right Size for Small Offices.

- **Perfect for the unique communication (and budgetary) needs of remote branch offices and telecommuters.**
- **Supports high-speed connections for Ethernet, voice, and data traffic—over just one ISDN BRI line (2B+D).**
- **Data compression gives you maximum bandwidth from each B channel for super-efficient connections.**
- **BONDING—Bandwidth on Demand—gives you the line capacity you need during periods of peak usage.**
- **A dozen models to choose from—with just the right feature mix to suit your office.**

Your Office Is Unlike Anyone Else's.

Maybe it's in your spare bedroom or your basement. Or maybe it's a satellite office 20 miles from headquarters or located around the world, hours from the nearest MIS guru. In any case, it's unique and it takes unique equipment to link it up, like our new Series 2000 ISDN Office Routers.

This all-new family of affordable ISDN Routers provides the power and flexibility you need to connect your small office back to the main office at digital rates up to 128 Kbps via a single 2B+D ISDN basic-rate interface (BRI) line.

With capacity to support top speeds and ever-falling service rates, it's no wonder ISDN is the preferred access method of network pros in Europe, Asia, and Australia—and no wonder that it's growing increasingly popular in the U.S.

These easy-to-install, easy-to-use Routers enable you to build the perfect ISDN internetwork. Use one at your branch site to support a remote Ethernet connection to headquarters. Even better, attach a dedicated modem or fax machine to the same line and support two simultaneous communication links: data and voice, or data and fax. One Router gives you two connections for the price of one. And that's not all!

Intelligent Features for Intelligent Connections.

By choosing a Series 2000 ISDN Office Router, you're not only getting access to two 64-Kbps high-speed circuits, you're also getting your choice of options.

Choose Routers with S/T or U ISDN interfaces, point-to-point protocol (PPP) for Internet links, or protocol spoofing to dynamically drop dormant ISDN lines and reduce connect-time charges. Note, too, that the voice channel feature is an option listed in the selection chart **below**.

Simply find the Router with the right feature mix for your small-office application or give us a call and we'll help you decide.

Going Global? Go Black Box!

With the popularity of ISDN overseas and the rapid emergence of global markets, it makes sense to choose an equipment supplier with worldwide experience. That's why so many top network managers choose Black Box for all their connectivity solutions—national and global.

With offices in 77 countries around the world, we have local experts who can help you make the right decisions for your international internetwork, no matter where "local" happens to be.

So call Black Box *TODAY* and make the right connection—*right away!*

ISDN
New
BLACK BOX
(412) 746-5500
Series 2000 ISDN Office Router
Power
Lan
Link One
Link Two

SPECIFICATIONS

Line Type — Leased, PSTN, ISDN
Protocols — LAN: IP, IPX;
WAN: PPP
CE Approval — All items listed are approved
Speed — Up to 128 Kbps
Connectors — (1) DB15 AUI and (1) RJ-45; Models with voice capabilities also have (2) RJ-11 ports
Power — 115–230 VAC, 60–50 Hz autosensing
Size — 2.3"H x 8.5"W x 13"D (5.7 x 21.6 x 33 cm)
Weight — 11 lb. (5.1 kg) shipping weight

BUYER'S GUIDE

SERIES 2000 ISDN OFFICE ROUTERS

Router Protocol	Features	ISDN Interface Voice	ISDN Interface S/T	ISDN Interface U	Code	Price
IP	with PPP		✔		LR2000A-ISDN-S	$950.00
				✔	LR2000A-ISDN-U	$1050.00
		✔	✔		LR2000A-VISDN-S	$1150.00
		✔		✔	LR2000A-VISDN-U	$1250.00
IP/IPX™	with PPP		✔		LR2002A-ISDN-S	$1150.00
				✔	LR2002A-ISDN-U	$1250.00
		✔	✔		LR2002A-VISDN-S	$1350.00
		✔		✔	LR2002A-VISDN-U	$1450.00
	with Protocol Spoofing		✔		LR2004A-ISDN-S	$1150.00
				✔	LR2004A-ISDN-U	$1250.00
		✔	✔		LR2004A-VISDN-S	$1350.00
		✔		✔	LR2004A-VISDN-U	$1450.00

remember to order cables

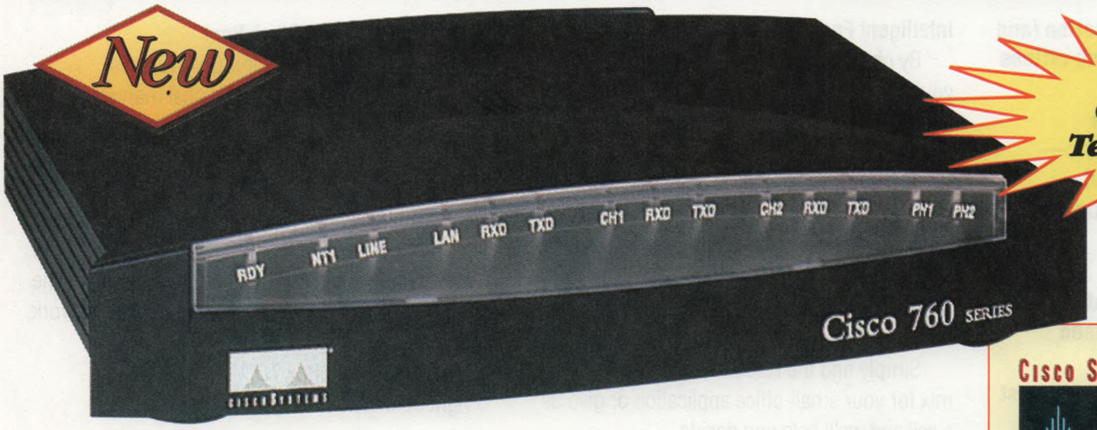
RJ-45 (8-Wire) Modular Cable, 4-ft. (1.2-m), Straight-Pinned EL08MS-04 $3.95

For other lengths and pinnings, see p. 71.

FAXBACK INFORMATION
Request Document Number: 18564
Call 412-746-5500 Anytime

Cisco Series 760 ISDN Routers

Bring the Power of ISDN to Your Telecommuters and Small- and Home-Offices Environments.



For Small Offices and Telecommuters

- **High-speed remote access to the Internet as well as enterprise networks.**
- **Ideal for telecommuters and PC or Mac® users.**
- **Provides complete bridge/router functions for IP and IPX networks.**
- **Analog support saves time and money—no separate phone lines or ISDN telephones are needed.**
- **ISDN BRI offers 128-Kbps throughput and 4:1 data compression.**
- **ConnectPro software makes installation and configuration simple—no serial cables or terminal-emulation software needed.**

With the ability to support up to four attached devices, the new Cisco Series 760 ISDN Routers are the perfect choice for small- or home-office environments that need reliable, high-performance solutions for voice and data-communication needs.

With multilink point-to-point protocol (PPP), you don't have to worry whether these Routers will work with your existing products. You also have dual telephone service options, bandwidth management, and SNMP support.

The 761 model is ideal for connecting an Ethernet LAN to ISDN BRI services. Models are available for worldwide use. The 762 model also includes an integrated NT1 device for ISDN users in North America.

The 766 model includes two RJ-11 interfaces for use with analog telephones, modems, and fax machines. These devices can share the same ISDN BRI line—eliminating the need for multiple telephone lines or expensive ISDN phones. Other features include call waiting, call retrieve, call hold, three-way conferencing, call transfer, and cancel call hold.

Up to four MAC addresses are supported by each Router. If you need additional MAC addresses, the Remote Office Feature Set can support up to 1500 MAC addresses for added flexibility.

Dial-on-demand IP and IPX™ routing over ISDN provide full bridge/router functions. Since the Routers dial the ISDN line only when it's needed and then automatically take the connection down, you can reduce line costs without disrupting performance.

Configure both ISDN B channels to support any combination of two voice and/or data calls. Use call priority to present or reject incoming calls if both B channels are being used for data communication. And forget about confusing configuration software or cables—just use your touchtone phone to enter your initial set of configuration parameters.

Link authentication, callback security, and Personal Network Profiles protect your resources and limit network access for added security. You can manage your Routers via SNMP, Telnet™, or any terminal-emulation software program.

FAXBACK INFORMATION
Request Document Number: 18423
Call 412-746-5500 Anytime

CISCO SYSTEMS® *from* BLACK BOX

Installation Help—without the Wait.

Confused about configuring your router? No problem. Our techs are trained and certified to support every Cisco product we carry. And you'll get the answers you need without having to wait more than 20 seconds.

If you buy a Cisco product elsewhere, you'll be charged a large percentage of the product cost just for tech support. And you'll have a long wait before someone actually answers your call. Or your question.

At Black Box, you get fast answers at the right price—because our Tech Support is always FREE! So why waste time anywhere else? Call Black Box today!

SPECIFICATIONS

Line Type — ISDN
Protocols — LAN: IP, IPX; WAN: PPP
CE Approval — CISCO762-US
Indicators — LEDs: RDY, NT1 LINE, LAN, RXD, TXD, CH1
Power — 110 VAC, 60 Hz, external power supply
Size — 1.6"H x 8.3"W x 9.6"D (4.1 x 21.1 x 24.4 cm)
Weight — 1.6–1.7 lb. (0.7–0.8 kg)

Item	Code	Price
Cisco Series 760 ISDN Routers		
761 Ethernet/ISDN BRI IP/IPX	CISCO761-CH	**$599.00**
762 Ethernet/ISDN NT1 IP/IPX	CISCO762-US	**$649.00**
766 Ethernet/ISDN NT1 IP/IPX w/Two POTS	CISCO766-US	**$799.00**
Remote Office Feature Set	SW760B-US-3.2	**$300.00**

remember to order cables

Category 5 Patch Cable, (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

Cisco Series 1600 Modular Routers

Extend Network Access to the World Wide Web.

- **Ideal for Internet and Intranet access.**
- **Choose from async/sync serial, serial with integrated CSU/DSU, ISDN BRI, or ISDN BRI with integrated NT-1 port module options.**
- **Use the extra WAN slot for an additional serial or ISDN WAN card.**
- **ClickStart setup allows for easy installation and configuration.**
- **Supports Frame Relay, ISDN, leased lines, basic telephone service, Switched 56, SMDS, and X.25.**
- **Manageable by CiscoWorks Windows.**
- **Comes with incorporated IOS IP feature set.**

New
Cisco 1600

The new Cisco Series 1600 Modular Routers make it easy to provide access to the Internet and Intranet while maintaining secure links to mobile users and branch offices. You can even add equipment, users, or remote locations easily without affecting performance.

The Series 1600 Routers offer both WAN and LAN ports for complete configuration flexibility. You can select a 10BASE-T port with a synchronous serial port, or an ISDN interface with or without an integrated NT-1 device. An extra WAN slot enables you to expand your WAN as needed in the future.

A variety of software feature sets support multiprotocol routing of IP, IPX™, and AppleTalk®, and transparent bridging of all other protocols.

With ISDN dial backup, a secondary WAN link is activated should the primary link fail. And one WAN line can support data, voice, and video at the same time.

As with most Cisco products, the 1600 Series contains incorporated IOS™ technologies for guaranteed interoperability, security, enhanced multimedia support, dial-on-demand routing, bandwidth on demand, and protocol spoofing.

Web browser-based ClickStart™ setup eases installation headaches. AutoInstall enables you to download router configurations over Frame Relay or across leased lines from one location.

Use CiscoWorks™ Windows (see **page 553**) for complete management and control of all router configurations.

BUYER'S GUIDE

SERIES 1600 MODULAR ROUTERS

Features	Base Configuration	WAN Speed	WAN Connector	Optional WAN Card
Ethernet/Serial (CISCO1601)	1 Ethernet 1 Sync/Async Serial Port	Sync up to 2.048 Kbps	DB-60	Serial Sync/Async, ISDN BRI S/T, ISDN BRI U
with 56K DSU (CISCO1602)	1 Sync CSU/DSU Serial Port	4-Wire CSU/DSU at 56 Kbps	RJ-48S	Serial Sync/Async, ISDN BRI S/T, ISDN BRI U
Ethernet/ISDN-BRI (CISCO1603)	1 ISDN BRI S/T Port	Up to 256 Kbps	RJ-45	Serial Sync/Async
with NTI (CISCO1604)	1 ISDN BRI U Port with NT-1 Termination	Up to 256 Kbps	RJ-45	Serial Sync/Async
All Models:				
LAN Connector	10BASE-T, RJ-45 or AUI, DB15			
Processor	Motorola 68360 QUICC at 33 MHz			
Memory	4-MB Flash and 2-MB DRAM			
Console Port	RJ-45			

Internet/ Intranet Access

SPECIFICATIONS

Data Compression — STAC, PPP/CCP
Line Type — Leased, PSTN, ISDN
Packet Filtering — Based on network address MAC address, port number, or socket number
Protocols — LAN: IP, IPX, AppleTalk; WAN: PPP, Frame-Relay
Security — PAP, CHAP, access lists, Lock and Key, 40/56-bit data encryption
Power — 100–240 VAC, 50–60 Hz
CE Approval — CISCO1601–CISCO1604, WIC-1T, WIC-1B-S/T, WIC-1B-U
Size — Chassis: 2.2"H x 11.2"W x 8.7"D (5.6 x 28.3 x 22 cm); WAN Interface Cards: 0.8"H x 3.1"W x 4.8"D (2.1 x 7.9 x 12.2 cm)
Weight — Chassis: 1.8 lb. (0.8 kg); WAN Interface Cards: 0.2 lb. (<0.1 kg)

Item	Code	Price
Cisco Series 1600 Modular Routers		
Ethernet	CISCO1601	**$1495.00**
w/56K DSU (4-Wire)	CISCO1602	**$1695.00**
ISDN-BRI	CISCO1603	**$1495.00**
w/NT-1	CISCO1604	**$1695.00**
You need to order the following for each Cisco 1600 Router...		
Cisco 1600 IP Feature Set	SF160C-11.1.8A	**$15.00**

FAXBACK INFORMATION
Request Document Number: 18430
Call 412-746-5500 Anytime

Item	Code	Price
You may also need additional...		
IOS Feature Sets		
IP Plus	SF160CP-11.1.8A	**$400.00**
IP/IPX Plus	SF160BP-11.1.8A	**$800.00**
IP/IPX/AT®	CD16-A/B/E-11.2	**$400.00**
Memory Modules		
8-MB DRAM SIMM	MEM1600-8D=	**$700.00**
8-MB Flash Card	MEM1600-8FC=	**$800.00**
WAN Interface Cards		
1-Port Serial	WIC-1T	**$400.00**
1-Port ISDN	WIC-1B-S/T	**$500.00**
1-Port ISDN w/NT-1	WIC-1B-U	**$700.00**
remember to order cables Category 5 Patch Cable, (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

Internet Access Routers

Link up to 20 Users to the Internet with One Router—and One User Connection from Your ISP.

- **Use the innovative Single IP feature to dial into one low-cost ISP connection and simultaneously route traffic for up to 20 Internet users.**
- **Specially designed to link medium-sized networks to the Internet.**
- **A complete family of Internet routers with multiple interfaces to connect via dialup or leased lines, DDS, ISDN, or Frame-Relay digital services.**
- **All models support PPP, SLIP, CSLIP, and MultiLink PPP protocols.**
- **Async rates up to 115.2 Kbps; sync rates up to T1 speed (1.544 Mbps).**
- **Provides instantaneous connection on demand.**
- **Flash memory for software downloading.**

New
BLACK BOX®
(412) 746-5500
Internet Access Router
POWER
READY
LAN
DATA
ERROR
LINK

Network managers are facing increased user demands for Internet access: e-mail, file-transfer capabilities, access to valuable information—it's easy to justify the need. Now you can justify the expense with the only Internet Access Router designed especially for linking small- to mid-sized networks to the Internet.

Link up to 20 end-users to the Net with just one Router no matter what kind of Internet connection or speeds you need. With 16 different models to choose from, Black Box has exactly the Router you need to get wired—easily.

A "Configuration WIZARD" is built into each Router to simplify setup and everyday maintenance. There are also built-in firewall options to protect your LAN from things that go "bump" in the Net.

Another feature that makes this Router family special is "Single IP" address (read all about it, **at left**). It simplifies the procedures necessary to provide Internet access to multiple users.

Unique "Single IP" Feature Simplifies Internet Connections.

How? These new Internet Access Routers dynamically allocate just one IP address to serve as a single point of access to the Internet for every network user (up to 20) attached to the Router.

The alternative—establishing unique IP addresses for every LAN node—would be both time-consuming and expensive, based on the management resources such a task would require.

This Single IP feature not only simplifies your Internet connection (a particularly desirable benefit if you have contractors or consultants do most of your IS management and installation work for hire), but it also supports simultaneous Internet connections for multiple end-users—a great, economical way to maximize your equipment resources by getting the most connectivity for your money.

Call one of our LAN Tech Support experts today to learn more about Single IP—412-746-5500.

POWER
10BaseT
CONTROL
LINK
V.35

This Connector Won't Support Your Internet Link?
Black Box can help—our Internet Access Routers come with multiple port options to support virtually any kind of Internet connection you need!

SPECIFICATIONS

Line Type — Leased, PSTN, ISDN
Protocols — LAN: IP;
WAN: PPP, Frame-Relay
Speed — ISDN: Up to 128 Kbps;
RS-232, CSU/DSU: Sync: Up to 64 Kbps;
Async: Up to 115.2 Kbps;
RS-530, V.35, V.36, X.21: Up to 1.544 Mbps
CE Approval — All items listed are approved
Connectors — LAN: (1) BNC or (1) RJ-45;
Link: ISDN: RJ-45 (S or U interface);
CSU/DSU: RJ-45;
RS-232, RS-530: DB25 female;
V.35: 34-pin M Block female;
RS-422 (V.36): DB37 female via adapter cable;
X.21: DB15 female via adapter cable
Indicators — (6) LEDs: POWER, READY, LAN DATA, LAN ERROR, LINK DATA, LINK ERROR
Power — 115–230 VAC, 50–60 Hz, 10 VA max.
Size — 1.8"H x 9.6"W x 8.5"D (4.6 x 24.4 x 21.6 cm)
Weight — 2.1 lb. (1 kg)

FAXBACK INFORMATION
Request Document Number: 17824
Call 412-746-5500 Anytime

INTERNET ACCESS ROUTERS

Features	BNC	UTP
Basic Rate ISDN (S Interface)	LR0002A-BSDN **$980.00**	LR0002A-TSDN **$980.00**
Basic Rate ISDN (U Interface)	LR0002A-BUDN **$980.00**	LR0002A-TUDN **$980.00**
Built-In CSU/DSU	LR0002A-BCSU **$1190.00**	LR0002A-TCSU **$1190.00**
RS-232	LR0002A-BV24 **$890.00**	LR0002A-TV24 **$890.00**
V.35	LR0002A-BV35 **$890.00**	LR0002A-TV35 **$890.00**
RS-422 (V.36)	LR0002A-BV36 **$890.00**	LR0002A-TV36 **$890.00**
X.21	LR0002A-BX21 **$890.00**	LR0002A-TX21 **$890.00**
RS-530	LR0002A-B530 **$890.00**	LR0002A-T530 **$890.00**

3Com® OfficeConnect™ Remote Routers • 3Com OfficeConnect Access Server 1000

Compact Components to Simplify Small-Office and Remote-Network Connections.

- **A fully integrated family of easy-to-use desktop components for LAN, WAN, and Internet connectivity.**
- **High-speed ISDN connections to any remote workstation.**
- **Integrates fully with Windows® 95 and Windows NT™ software.**
- **Compatible with the entire OfficeConnect family of small-office solutions—mix and match components to your office needs.**

MORE! 3Com Products pp. 486, 492, 494, 496, 509–510, 512, 538, 561, 564–565, 570, and 581.

3Com Office Connect Remote Routers

With the OfficeConnect™ Remote series from 3Com®, expanding and developing your small-office LAN is a snap. High-speed ISDN links enable you to connect to your corporate headquarters, business partners, the Internet, or any other networked information resources that can enhance your business interests.

The OfficeConnect Remote family provides fast and economical ISDN connections to a range of remote resources—while allowing high-speed voice or fax transmissions over the same ISDN line. Users get the transmission speeds needed to access complex graphical information, and to keep data and voice traffic moving without delay.

All models offer data compression, "spoofing," PPP for WAN interoperability, and network-to-network bridging and routing. Plus, installation and configuration are simple, so your network will be up and running in minutes. Plus, if you need to expand, that's easy, too—just clip on the additional unit you need.

Remote Routers at a Glance:

510U—(1) ISDN Basic Rate Interface (BRI) port (2 x 64 Kbps channels); (1) BNC and (1) RJ-45 LAN port; Channel aggregation up to 128 Kbps; Data compression and spoofing; PPP for WAN interoperability; perfect for Internet access.

520U—Same as the 510 Remote Router, plus: Integral Voice port for ISDN connection of phones for fax machines; perfect for small-office networking solutions.

530U—Same as the 520 Remote Router, plus: (1) leased-line port to support fast, dedicated network-to-network traffic; perfect for branch-office solutions.

Remote Access Server 1000 at a Glance:

(2) slots for PC Card analog modems or ISDN terminal adapters; (1) RJ-45, (1) BNC, and (1) DB9 connector; protocol support for IP, IPX, IPCP, and IPXCP.

Build the *Perfect* LAN for *Complete* Remote Connectivity.

A 3Com OfficeConnect Remote system from Black Box is the perfect solution for interoffice networking and Internet access. Simply stack the components you need for the right combination of connections and cable types. Best of all, you don't have to be a LAN expert to do it yourself—Black Box LAN technicians are only a phone call away, with the expert advice you need now *and* later.

3Com Office Connect Remote Access Server 1000

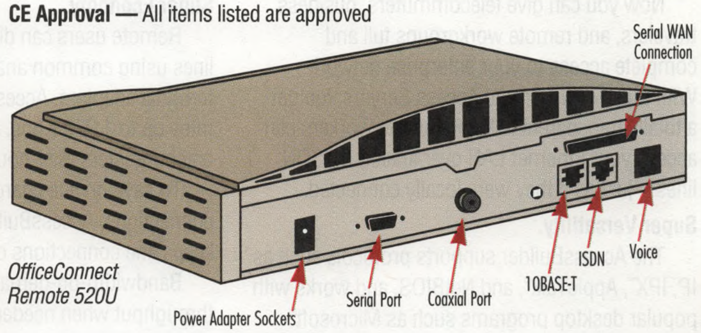
Your business is expanding rapidly—you now have as many remote users as corporate office workers. The 3Com OfficeConnect Remote Access Server 1000 can help.

The Remote Access Server 1000 offers IP/IPX™ dial-in for remote access to your corporate intranet and e-mail, as well as IPX dial-out for remote access to fax and modem pooling, the Internet, and other dial-out services.

Use the Access Server's two ports to make high-speed ISDN or analog PC Card connections to virtually any location for your business travelers, teleworkers, and other mobile workers.

Transcend's Quick Configuration Manager's Wizard leads you step by step through the setup. And with user-friendly graphics, monitoring network conditions and altering configuration information is quick and easy, too.

CE Approval — All items listed are approved



OfficeConnect Remote 520U

FAXBACK INFORMATION
For 3Com Office Connect Remote Routers: 17680,
For 3Com OfficeConnect Remote Access Server 1000: 18801,
Call 412-746-5500 Anytime

Item	Code	Price
OfficeConnect Remote Routers		
510U-ISDN	3C410015A	**$849.00**
520U-ISDN and Integral Voice Line	3C410020A	**$1149.00**
530U-ISDN, Integral Voice, and Leased Line	3C410025A-US	**$999.00**
New OfficeConnect Remote Access Server 1000	3C7102	**$1119.00**
remember to order cables Category 5 Patch Cable, (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
	For other lengths and colors, see p. 69.	
ThinNet Cable, 10-ft. (3.0-m)	LCN300-0010	**$17.95**
	For other lengths, see p. 77.	

NOTE: Standard discounts may not apply.

Terminal Servers
Wireless
Network Management
More LAN

BLACK BOX® + 3Com® = the best!

3Com® SuperStack II AccessBuilder Remote Access Servers

Complete Internet and Enterprise Access for Mobile and Remote-Office Workers.

MORE! 3Com® Products, **see pp. 486, 492, 494, 496, 509–510, 512, 537, 561, 564–565, 570, and 581.**

- **Provides network access and Internet access to remote offices and workgroups serving up to 50 users.**
- **Easy dial-in/dial-out access over analog or digital (ISDN) telephone lines.**
- **Transparent Ethernet links so you can work as if you are connected locally.**
- **Suppports a broad range of platforms, desktop systems, network operating systems, and network protocols.**
- **Multiprotocol bridging and routing for both client-to-LAN connections and wide-area LAN-to-LAN extensions.**
- **Offers advanced security features and third-party security support.**
- **Flexible, dynamic bandwidth management reduces dialup line charges.**

Now you can give telecommuters, business travelers, and remote workgroups full and complete access to your enterprise network. With these new Remote Access Servers you get a totally transparent link *and* remote workers can access your Ethernet LAN over analog or ISDN lines—just as if they were locally connected.

Super Versatility.

The AccessBuilder supports protocols such as IP, IPX™, AppleTalk®, and NetBIOS, and works with popular desktop programs such as Microsoft® Windows® 95. And that means users with all types of equipment—including PCs, and Macintosh® or UNIX® based computer systems—can connect to your network via the AccessBuilder. Plus, setup is easy with the Windows based installation program, utilities for one-click dialing, and more.

AccessBuilders are easy to configure and administer with management options such as in-band SNMP, out-of-band, and local management. A built-in SNMP graphical management interface supports IP and IPX. The asynchronous ports for client-to-LAN and LAN-to-LAN connections are software configurable. And the front panel is loaded with LEDs to monitor the LAN and WAN port status.

Super Economy.

Remote users can dial in via analog or ISDN lines using common analog modems or ISDN terminal adapters. AccessBuilders can handle data rates up to 115.2 Kbps. And you can schedule batch transfers after hours, when rates are lower.

To save on line charges in LAN-to-LAN connections, AccessBuilder's dial-on-demand keeps line connections open only when in use.

Bandwidth-on-demand supplies additional throughput when needed. The AccessBuilder supports Point-to-Point Multilink Protocol to combine multiple links into one logical link, widening the transmission pipe. It's a cost-effective alternative to leased lines, and enables multiple dialup lines to function as a backup link in case of leased-line failure.

Super Security.

Built-in security prevents unauthorized network access through password protection, PAP, CHAP, automatic callback, and network filters. AccessBuilder also automatically logs and reports all unauthorized access attempts and works with third-party hardware and software security systems.

SPECIFICATIONS

Line Type — Leased, PSTN, ISDN
Protocols — LAN: IP, IPX, AppleTalk, NetBIOS/NetBEUI; WAN: PPP, Frame-Relay
Speed — 115.2 Kbps
CE Approval — All items listed are approved
Connectors — (1) AUI, (1) BNC, (1) RJ-45, (4) or (8) DB25
Power — 115–230 VAC, 60–50 Hz, autosensing
Size — 2.5"H x 17"W x 11"D (6.4 x 43.2 x 27.9 cm)
Weight — 12 lb. (5.4 kg)

The SuperStack Family.

The AccessBuilder 2000 belongs to the innovative 3Com® SuperStack system—a flexible, cost-effective connectivity solution for local, wide-area, and SNA networks. It offers plug-and-play simplicity, cost savings, and adaptability for the future. For information on other SuperStack products, call Tech Support at **412-746-5500**.

FAXBACK INFORMATION
Request Document Number: 18540
Call 412-746-5500 Anytime

Item	Code	Price
3Com® SuperStack II AccessBuilder Remote Access Servers		
AccessBuilder 2204		
4-Port	3C7204	**$1999.00**
AccessBuilder 2208		
8-Port	3C7208A	**$2799.00**

For more information on the SuperStack AccessBuilder family, call Technical Support.

remember to order cables

Item	Code	Price
Category 5 Patch Cable (Beige)		
10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

Item	Code	Price
RJ-45 (8-Wire) Modular Cable, 7-ft. (2.1-m)		
Straight-Pinned	EL08MS-07	**$4.95**

For other lengths and pinnings, see p. 71.

BLACK BOX® + USRobotics® = *the best!*

BLACK BOX
SOLUTIONS

"My sales staff travels constantly, so they need network access while they're on the road. How can I support them without disrupting everyone else—or spending a fortune?"

A good place to start is with the NETServer models from Black Box and U.S. Robotics®. With NETServer/8 or /16 and a couple of telephone lines, you can access e-mail, download files, access the Internet and your intranet, or even interface with a corporate host from anywhere.

What's more, if you need ISDN speeds *and* analog support, try using a NETServer/8 or /16 I-Modem. This ISDN/modem combination enables you to receive analog or digital calls through the same channels so you don't have to install additional phone lines.

NETServer/8 and /16 • NETServer/8 and /16 I-Modem

The Network-Access Solution for Offices and Smaller ISPs.

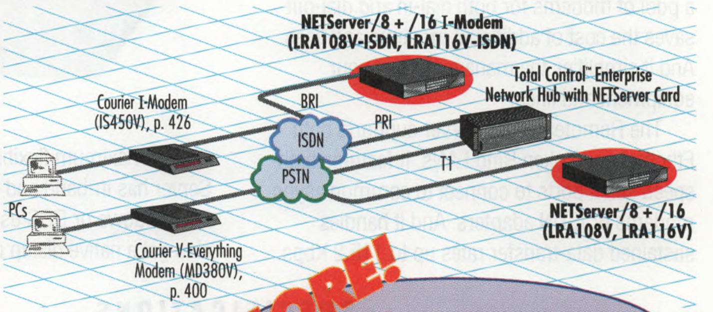
- **Incorporates Courier™ V.Everything™ V.34 modem technology.**
- **Combines remote dial-in access, LAN-to-LAN routing, and terminal-server functions with advanced management, security, and call-accounting capabilities.**
- **Ideal for office environments and smaller service providers—especially those providing Internet access.**
- **Stampede™ Remote Office™ Gold Client software provides seamless remote-node and remote-control connectivity.**

USRobotics
TOTAL CONTROL
NETServer/16 V.34
New
ISDN

The **NETServer/8 and /16** also include flash-ROM downloadable software, access security, per-user firewalls, Windows® 95 support, call accounting, NETStarter™ Auto Configuration Wizard, and dynamic IP addressing and port sharing.

The **NETServer/8 and /16 I-Modem** combine ISDN and modem technology in the same device, and it's the least expensive ISDN/analog solution on the market today.

Use Universal Connect™ to connect incoming calls automatically at the highest rates possible. The 8-Port model supports eight ISDN B channels and connects four ISDN BRI lines. The 16-Port model supports 16 ISDN B channels for connection to eight ISDN BRI lines.


NETServer/8 + /16 I-Modem
(LRA108V-ISDN, LRA116V-ISDN)
Total Control™ Enterprise Network Hub with NETServer Card
Courier I-Modem (IS450V), p. 426
BRI
PRI
ISDN
PSTN
T1
PCs
NETServer/8 + /16
(LRA108V, LRA116V)
Courier V.Everything Modem (MD380V), p. 400

MORE! U.S. Robotics® Modems, **see pp. 394–401.**

BUYER'S GUIDE

NETSERVER COMPETITIVE POSITION

Features	U.S. Robotics® NETServer 16 I-Modem	Ascend Max 1800
Number of Ports in Single Box	16	16
Number of Digital/Analog Ports Available	16/16	16/0, 8/8, or 0/16
Digital Lines Only	✓	✓
Digital or Analog on All Ports	✓	
Modem Technology Developed In-House	✓	
Integrated Courier Modem Technology	✓	
Flash-Upgradable Modems	✓	
Supports 33.6 Kbps	✓	

SPECIFICATIONS

Standards Supported — TCP, IP, RIP, SLIP, CSLIP, ICMP, UDP, ARP, Telnet™, PPP, RFC 1331, 1332, and 1334 for PPP, backward compatible with RFC 1171 and 1172

Interface — Ethernet up to 10 Mbps

Connectors — (1) RJ-45, (1) BNC

Power — 120 VAC, 15 VA

Size — 3.5"H x 17.5"W x 12.6"D (8.9 x 44.5 x 32 cm)

FAXBACK INFO
Request Document Number: 17893
Call 412-746-5500
Anytime

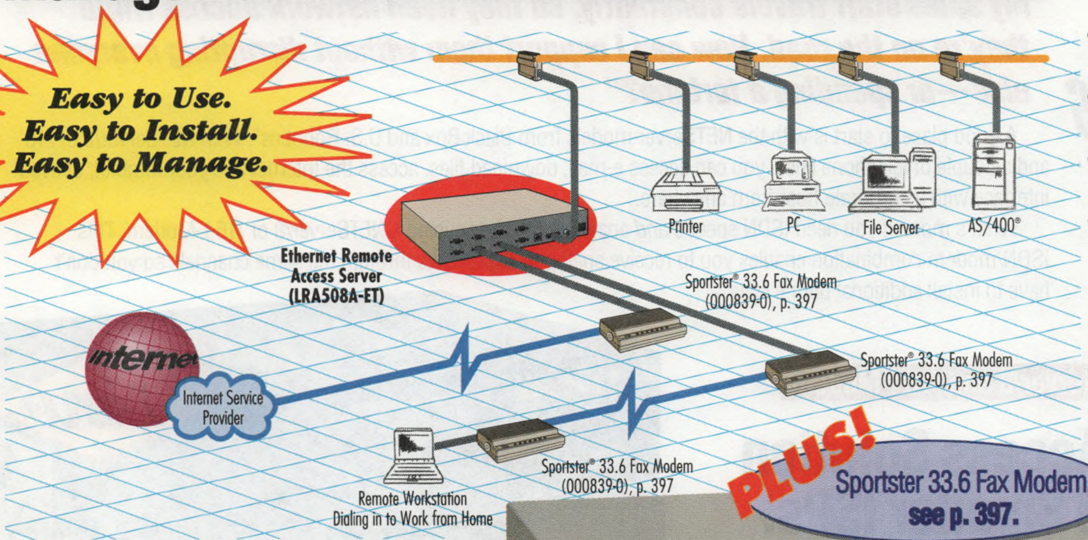
Item	Code	Price
NETServers		
8-Port	LRA108V	**$4495.00**
16-Port	LRA116V	**$8495.00**
8-Port I-Modem	LRA108V-ISDN	**$8995.00**
16-Port I-Modem	LRA116V-ISDN	**$13,995.00**
remember to order **cables** Category 5 Patch Cable (Beige)		
10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

Remote Access Server

Get Cost-Effective Dial-In and Dial-Out LAN Management with the Remote Access Server.

Easy to Use. Easy to Install. Easy to Manage.


Printer
PC
File Server
AS/400®
Ethernet Remote Access Server (LRA508A-ET)
Sportster® 33.6 Fax Modem (000839-0), p. 397
Internet
Internet Service Provider
Sportster® 33.6 Fax Modem (000839-0), p. 397
Remote Workstation Dialing in to Work from Home
Sportster® 33.6 Fax Modem (000839-0), p. 397

- Any port can be configured for dial-in, dial-out, or both.
- Supports Windows® 95, Windows 3.1x, or DOS.
- Also supports INT14 (IBM) and NASI (Novell).
- Access network resources using NetWare® 3.x or 4.x, OS/2, LAN Server, Windows for Workgroups, Windows NT™, IBM® or UNIX® hosts.
- In-band and out-of-band management functions for maximum flexibility.

PLUS! Sportster 33.6 Fax Modem, **see p. 397.**

UTP
LINK
STP
BLACK BOX
Remote Access Server
RAS

Top: Rear view of LRA508A-TR; Bottom: Front view of LRA508A-TR.

If you're not in the office every day and you need dial-in and dial-out access to other LAN servers and the Internet, this is your cost-effective solution.

With the Remote Access Server, sharing a pool of modems for both dial-in and dial-out saves the cost of additional modems and lines. And it simplifies the management of your equipment and lines.

The Remote Access Server supports both Ethernet and Token Ring LANs. It features high-speed serial ports to connect to common async modems or ISDN adapters. And it handles sustained data-transfer rates up to 115.2 Kbps.

For maximum flexibility, the Remote Access Server has in-band and out-of-band management for Windows or DOS users. Windows 95 users also get a native dialup networking facility.

Protect your corporate information systems from unauthorized access with the Server's individual user names and passwords, and fixed dial-back confirmation.

Menu-driven screens of the Remote Access Server guide you through a simple installation process. You can be online quickly and easily—in only five minutes! Install and operate the provided manager software from a PC attached to a LAN or a high-speed modem. The front-panel display and keypad make performing management tasks over the server easy.

SPECIFICATIONS

Protocol — Novell IPX™, TCP/IP, NetBIOS/NetBEUI, LLC2 (802.2)

CE Approval — All items listed are approved

Indicators — Power, System Operational, LAN Connect

Power — 90–230 VAC, 50–60 Hz, autosensing, 40 watts

Size — LRA502A-ET: 1.9"H x 8.5"W x 8.8"D (4.8 x 21.5 x 22.4 cm); All others: 1.8"H x 17"W x 9.7"D (4.6 x 43.2 x 24.6 cm)

Weight — LRA502A-ET: 4.9 lb. (2.2 kg); All others: 9.7 lb. (4.4 kg)

SUPPORT UNDER VARIOUS OPERATING SYSTEMS

Features	Windows 95	Windows 3.1	Windows for Workgroups	Windows NT	DOS	UNIX	OS/2
Able to Configure Server over Network							
with IP	✓	✓	✓				
with IPX	✓	✓	✓				
with Direct Connect	✓	✓	✓				
Dial into:							
NetWare with IP	✓	✓	✓	✓	✓	✓	
NetWare with IPX	✓	✓	✓	✓	✓	✓	
Windows NT with IP	✓	✓	✓	✓	✓	✓	✓
Windows NT with NetBEUI		✓	✓			N/A	
UNIX	✓	✓	✓	✓	✓	✓	✓
OS/2 LANserver and Other NetBEUI-Based Networks		✓	✓			N/A	
Dial out with NetWare IPX	✓	✓	✓		✓	N/A	

FAXBACK INFORMATION
Request Document Number: 16672
Call 412-746-5500 Anytime

Item	Code	Price
Remote Access Server		
Ethernet		
2-Port	LRA502A-ET-R2	**$1395.00**
4-Port	LRA504A-ET-R2	**$1750.00**
8-Port	LRA508A-ET-R2	**$2450.00**
Token Ring		
2-Port	LRA502A-TR-R2	**$1995.00**
4-Port	LRA504A-TR-R2	**$2350.00**
8-Port	LRA508A-TR-R2	**$3050.00**
For remote connections, you may also need:		
Sportster® 33.6 Fax Modem (**p. 397**)	000839-0	**$169.95**

Dial Out. Up to 57.6 Kbps!

Remote Access Servers (Dial-Out Modem Server)

Black Box Gives You Inexpensive and Easy-to-Use Remote Access.

BLACK BOX
(412) 746-5500
Remote Access Server
PORT 1
PORT 2
PWR
TX RX A1 A2 A3
TX RX B1 B2 B3
POWER SUPPLY
NETWORK
PORT 2
PORT 1
RS-232

- **Provides modem access for every workstation attached to your network.**
- **Two 115.2-Kbps ports support rapid data transfer and low connect times.**
- **You get network access to the Internet, Bulletin Board Services, online services, even mainframes—*from any workstation!***
- **Supports alphanumeric paging and faxing.**

PLUS! Sportster 33.6 Fax Modem, **see p. 397.**

Now there's a simple way to support modem access for *every user* on your network. Just attach the BLACK BOX® Remote Access Server to your LAN, plug in two modems, and start dialing out! You won't find a faster, more flexible, and easier-to-use network access server.

Installation is quick and easy. The Remote Access Server can be up and running in just minutes. It can also save you the expense of purchasing, installing, and maintaining multiple standalone modems—and that's a great value for any size network. The Server supports NetWare®, IBM® LAN Manager, Windows® for Workgroups, and most communication packages.

It's also compatible with popular network operating systems and any communication software that supports INT 14 or NCSI devices.

One Server supports two modems. You can install additional Servers, but since typical modem usage is sporadic, we estimate one Remote Access Server can support 20 workstations. You buy less equipment so you save money!

SPECIFICATIONS

Speed — Up to 57.6 Kbps
Standards — IEEE 802.3 10BASE2, ARCNET®
CE Approval — 230-VAC versions: LRA200AE-BT, LR200AE-BNC
Interface — RS-232
Connectors — LRA200A-BT: (1) RJ-45, (2) DB9; LRA200A-BNC: (1) BNC, (2) DB9
Indicators — (11) LEDs: (1) PWR, (5) Per Port: TX, RX, A1, A2, A3
Power — 115 VAC, 60 Hz (230-VAC, 50-Hz version on request)
Size — 1.4"H x 6.3"W x 9.5"D (3.6 x 16 x 24.1 cm)
Weight — 1.5 lb. (0.7 kg)

FAXBACK INFORMATION
Request Document Number: 16081
Call 412-746-5500 Anytime

Item	Code	Price
Remote Access Servers		
10BASE-T	LRA200A-BT	**$995.00**
BNC	LRA200A-BNC	**$995.00**
You may also need...		
Sportster® Fax Modem	000839-0	**$169.95**
AT Modem Cable, Premium 6-ft. (1.8-m)	EVMBMC-0006	**$17.95**

remember to order cables

For other lengths, see p. 109.

◆ ◆ ◆

Async Routers • Sync Router

Now Make Affordable On-Demand WAN Connections via Dialup, Leased, or DDS Lines!

- **Built-in V.34 modem makes the connection at 28.8 Kbps!**
- **Full router performance over ordinary dialup lines. No more costly leased-line links.**
- **More efficient than terminal emulation.**
- **Supports TCP/IP, IPX™, and SNMP.**
- **Faster processing of IP RIP updates.**
- **Dual LAN port option: Use RJ-45 or AUI.**
- **Easy installation.**

If your WAN traffic is less than heavy and constant, these Routers can save you a bundle. They activate a link over a dialup line and route data traffic only as needed. When the Router sees traffic intended for the other side of the link, it automatically dials the line and establishes communication. After a time without traffic, the line is dropped. So you're charged only when the link is in use.

It's a perfect solution when a branch office or mobile workforce needs to access your LAN.

Async Router and Async Router AR-5

Both BLACK BOX® Async Routers come with an integrated V.34 bis modem with V.42 bis error correction and MNP® 5 data compression. The **Async Router** supports one remote connection over an ordinary dialup line. The **Async Router AR-5** supports up to five remote LANs or remote PCs.

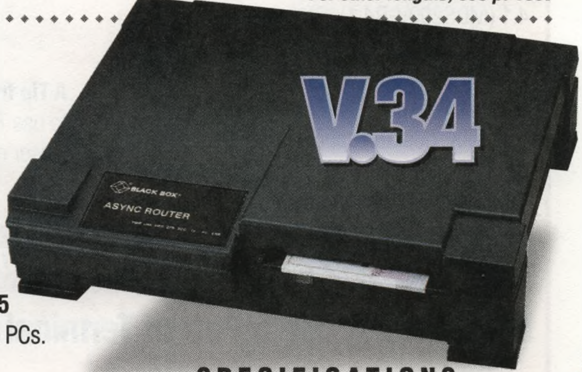
Sync Router, V.34

Get all the features of our Async Router and a sync DDS connection, too.

The **Sync Router, V.34** features a single sync V.35 interface with speeds up to 128 Kbps. It supports both Switched 56 and DDS leased lines at either 56- or 64-Kbps, as well as ISDN-BRI with a terminal adapter. It's ideal for connecting to remote LANs via standard phone lines while waiting for your DDS, ISDN, or SW56 lines.

If the DDS line fails, you have automatic dial backup with the built-in modem and dialup connection. Switching is via the RIP protocol. The Sync and Async Routers have identical features except for the supported WAN speed and type of connector.

FAXBACK INFORMATION
Request Document Number: 12719
Call 412-746-5500 Anytime



SPECIFICATIONS

Diagnostics — Via LEDs or management code (supports Telnet login), SNMP
Integrated Modem — V.34 bis with V.42 bis error correction and MNP 5 data compression
Protocols — IP, IPX
Speed — 10-Mbps Ethernet; 28.8-Kbps integrated modem
Standards — Ethernet: AUI, 10BASE-T; IP, SNMP, V.32 bis/V.42 bis
Connectors — All: (1) DB9 male, (1) DB15 AUI female, (1) RJ-45 female, (1) 5-pin DIN; LRA001A-R2: (1) RJ-11; LRA005A-R2: (5) RJ-11; LRS002A-R2: (1) RJ-11, (1) DB25 female
Power — 115/230-VAC, 60/50-Hz external supply (autoswitching)
Size — 2.5"H x 9.8"W x 8.3"D (6.4 x 24.9 x 21.1 cm)
Weight — 3.6 lb. (1.6 kg)

Item	Code	Price
Async Router	LRA001A-R2	**$1695.00**
Async Router AR-5	LRA005A-R2	**$3995.00**
Sync Router, V.34	LRS002A-R2	**$2195.00**
To connect your Sync Router, you'll need...		
CSU/DSU MS (**p. 421**)	MT132A-R2	**$725.00**

BLACK BOX® Ethernet RS-232 Terminal Servers. Critical Components in a Range of Applications: Simple to Complex.

Link dumb terminals to a host over your Ethernet LAN, or connect paying customers to the Internet via *your own* for-profit Internet access service. The key components in both scenarios—BLACK BOX® Terminal Servers.

Terminal Servers provide a single access point to link multiple RS-232 devices transparently via one data circuit—kind of like a multiplexor but with built-in protocols for communicating in network or mainframe applications.

Whether you attach your Terminal Server to an Ethernet, the Internet, or some other data circuit depends on your application, *but that's precisely the point!* BLACK BOX® Terminal Servers are versatile enough to offer flexible money-saving solutions in a *variety* of environments.

Who Uses Terminal Servers? Our Techs are fielding tons of calls from Internet-access entrepreneurs setting up their own services (see **below**). Another popular application is dialout Internet access from a LAN. Call our Experts at **412-746-5500** to develop your own Terminal Server Solution.

BLACK BOX SOLUTIONS

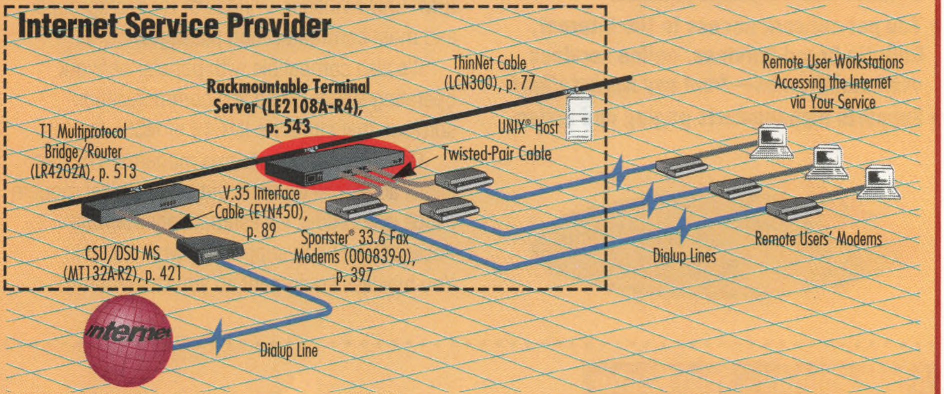
"What do I need to become an Internet Service Provider?"

Start with Plenty of Initiative, and a BLACK BOX® Terminal Server...

In the diagram **at right**, the BLACK BOX® Rackmount Terminal Server (LE2108A-R4) functions as the centerpiece of a startup Internet-access business. It's used as a modem "front end" to support connections for paying subscribers who dial in and surf the Web.

Using PPP or SLIP protocols, it enables remote customers to access the Internet using popular browsing packages such as Netscape Navigator™ (MDS100V-R3.0) or Internet Office™ 4.1 (MDS200V-R4.1). See **page 51**.

According to our Technical Experts, the Internet Service Provider in this example would use an existing TACACS daemon running on the UNIX® host to support user verification for security purposes, and maintain activity logs for accounting and billing purposes.


Internet Service Provider
Rackmountable Terminal Server (LE2108A-R4), p. 543
ThinNet Cable (LCN300), p. 77
UNIX® Host
Twisted-Pair Cable
T1 Multiprotocol Bridge/Router (LR4202A), p. 513
V.35 Interface Cable (EYN450), p. 89
CSU/DSU MS (MT132A-R2), p. 421
Sportster® 33.6 Fax Modems (000839-0), p. 397
Remote User Workstations Accessing the Internet via Your Service
Remote Users' Modems
Dialup Lines
internet
Dialup Line

A Tip from Our Experts: Before attaching modems to the Terminal Server ports, define the ports to use TACACS verification and PPP or SLIP protocol. Then when users dial in, they must first enter a user name and password for verification by the host before gaining access.

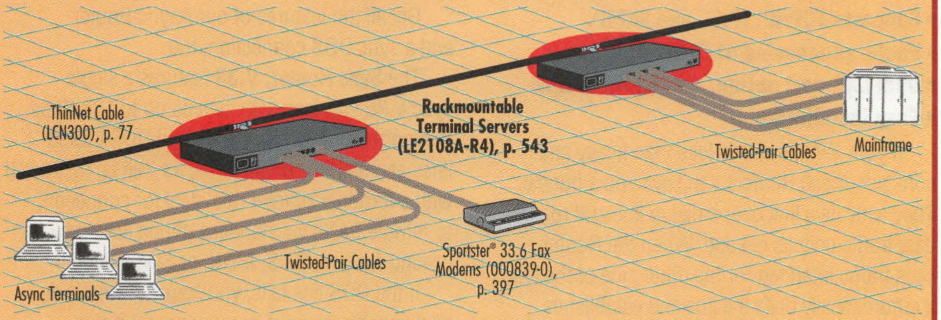
"Save money by adding async traffic to my Ethernet? How?"

For Starters, Use a Pair of Terminal Servers to "Multiplex" Terminal-to-Host Data.

Terminal Servers can merge multiple RS-232 signals into one Ethernet TCP/IP signal for transmission via your existing backbone cable. They enable you to use your LAN to piggyback host data, instead of leasing multiple separate lines to support host communications!

This "multiplex" application can transmit any RS-232 async traffic transparently over your network. Use it to support terminal-to-host connections (as shown), modem-sharing, modem-to-host links—anything!

Not using TCP/IP? That's no problem either. Even though our Terminal Servers use TCP/IP or LAT™ protocols exclusively (and won't work with Novell® NetWare® or other incompatible protocols), they *will* co-exist with those protocols when used in pairs. The Terminal Servers simply ignore all other protocols and communicate exclusively with each other.


ThinNet Cable (LCN300), p. 77
Rackmountable Terminal Servers (LE2108A-R4), p. 543
Twisted-Pair Cables
Mainframe
Async Terminals
Twisted-Pair Cables
Sportster® 33.6 Fax Modems (000839-0), p. 397

A Tip from Our Experts: When using Terminal Servers to support this "multiplexor" application, define IP addresses for each port of the target Terminal Server. Then configure the source Terminal Server to permanently Telnet™ to those predefined ports. Users may then connect directly and transparently to the appropriate corresponding RS-232 host port from anywhere on the network. Of course, you'll also have to configure baud rate, flow control, and other parameters for the individual ports, but in general, configuring Terminal Servers for Ethernet access is a relatively simple procedure that can immediately save you the expense of leasing extra data lines.

Economical Terminal Servers

Piggyback RS-232 Async Data over Your Existing TCP/IP LAT Ethernet.

- **Use a command-line syntax similar to DECserver™ 200s.**
- **Support remote connections via modem.**
- **Compact size: desktop or rackmountable.**
- **Single-Port Terminal Servers support data transfer up to 115.2 Kbps.**

Use an Economical Terminal Server to connect your PCs, ASCII terminals, printers, modems, and hosts to an Ethernet LAN while significantly simplifying your wiring scheme. Provide users with async connections wherever you need them—in the office, lab, or branch sites.

These Terminal Servers connect from 1 to 8 async devices, and establish sessions between terminals, printers, and any hosts connected to a LAN supporting LAT™ or TCP/IP protocols. Just link them to the Ethernet backbone, with a single wire. Remote PCs and workstations connect via PPP or SLIP protocols. You get a high-speed, low-cost full-IP-network link suitable for Telnet®, file transfer, and client-server-distributed applications.

FAXBACK INFORMATION
For Economical Terminal Servers: 13576
Call 412-746-5500 Anytime

Item	**Code**	**Price**
Economical Terminal Servers		
1-Port		
10BASE-T	LE2101A-T-R2	**$650.00**
10BASE-T/BNC	LE2101A-BT-R2	**$650.00**
4-Port		
TCP-AUI	LE2104A-AUI-R2	**$1299.00**
TCP-BNC	LE2104A-BNC-R2	**$1299.00**
TCP-TP	LE2104A-TP-R2	**$1299.00**
TCP/LAT-AUI	LE2204A-AUI-R2	**$1349.00**
TCP/LAT-BNC	LE2204A-BNC-R2	**$1349.00**
LAT/TCP-UTP	LE2204A-TP-R2	**$1349.00**
8-Port		
TCP-AUI	LE2508A-AUI-R2	**$1499.00**
TCP-BNC	LE2508A-BNC-R2	**$1499.00**
TCP-TP	LE2508A-TP-R2	**$1499.00**
TCP/LAT-AUI	LE2608A-AUI-R2	**$1599.00**
TCP/LAT-BNC	LE2608A-BNC-R2	**$1599.00**
TCP/LAT-TP	LE2608A-TP-R2	**$1599.00**

SPECIFICATIONS

Protocol — LAN: Telnet (TCP/IP), LAT; Serial Ports: None, PPP, SLIP
Speed — Ethernet: 10 Mbps; Serial: up to 115 Kbps
CE Approval — All items listed are approved
Connectors — LE2104A-R2, LE2204A-R2, LE2508A-R2, LE2608A-R2: (1) 36-pin Centronics®; LE2101A-R2: (1) DB25, (1) RJ-45 (LE2101A-BT-R2 also has [1] BNC)
Power — LE2104A-R2, LE2204A-R2, LE2508A-R2, LE2608A-R2: 100–230 VAC, autosensing; LE2101A-R2: 115 VAC, 60 Hz, external
Size — LE2104A-R2, LE2204A-R2, LE2508A-R2, LE2608A-R2: 1.7"H x 8.5"W x 11.7"D (4.3 x 21.6 x 29.7 cm); LE2101A-R2: 1.5"H x 4.5"W x 7.5"D (3.8 x 11.4 x 19 cm)
Weight — LE2104A-R2, LE2204A-R2, LE2508A-R2, LE2608A-R2: 4.7 lb. (2.1 kg); LE2101A-R2: 1 lb. (0.5 kg)

PLUS! Sportster 33.6 Fax/Modem, **see p. 397.**

Rackmountable Terminal Servers

Transparent, Dial-In Access to the Internet—from Our Rackmountable Terminal Servers.

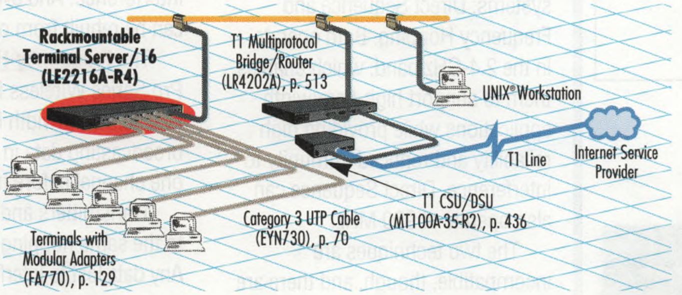
- **Connect up to 8 or 16 async devices—including terminals, PCs, printers, and modems.**
- **Choose single-protocol or LAT/TCP. You can even upgrade later.**

Async devices, like terminals, can now get transparent dial-in access to the Internet. And they can get multiprotocol support, too—LAT, Novell® IPX™ (for printing), Telnet™ 3270, and TCP/IP—all with a Rackmountable Terminal Server.

Each high-speed port gives you data rates to 115.2 Kbps. A Rackmountable Server can run with V.32 bis/V.42 bis modems, so you get top speed over phone lines.

You also get full TCP/IP support: RLOGIN, Dynamic SLIP, PPP, BOOTP, TFTP, SNMP, and Telnet, plus security. With 3270 emulation, you can use a PC to access an IBM® host running TCP/IP.

Software upgrades are easy. Just download the new software to the Server.


Rackmountable Terminal Server/16 (LE2216A-R4)
T1 Multiprotocol Bridge/Router (LR4202A), p. 513
UNIX® Workstation
Internet Service Provider
T1 Line
T1 CSU/DSU (MT100A-35-R2), p. 436
Category 3 UTP Cable (EYN730), p. 70
Terminals with Modular Adapters (FA770), p. 129

SPECIFICATIONS

Flow Control — X-ON/X-OFF, DTR/DSR, RTS/CTS
Memory — 2-MB RAM, 64-KB nonvolatile RAM, 1-MB ROM
Protocol — LAT, TCP/IP, TN3270
Speed — Up to 115.2 Kbps per port; Aggregate Throughput: 384 Kbps
CE Approval — LE2008A-R4–LE2208A-R4, LE2408A-R4, LE2016A-R4–LE2416A-R2
Connectors — All: (1) DB15 AUI, (1) BNC, (1) RJ-45; 8-Port Models: (8) RJ-45 (serial); 16-Port Models: (16) RJ-45 (serial)
Power — Universal input switcher, 85–264 VAC, 47–63 Hz, 40 watts
Size — 1.8"H x 16.8"W x 12"D (4.6 x 42.7 x 30.5 cm)
Weight — 5 lb. (2.3 kg)

FAXBACK INFORMATION
Request Document Number: 11811
Call 412-746-5500 Anytime

Item	**Code**	**Price**
Rackmountable Terminal Servers		
8-Port		
LAT	LE2008A-R4	**$1999.00**
TCP	LE2108A-R4	**$1999.00**
LAT/TCP	LE2208A-R4	**$2299.00**
TCP 3270	LE2308A-R2	**$2198.00**
LAT/TCP 3270	LE2408A-R2	**$2498.00**
16-Port		
LAT	LE2016A-R4	**$2599.00**
TCP	LE2116A-R4	**$2599.00**
LAT/TCP	LE2216A-R4	**$2999.00**
TCP 3270	LE2316A-R2	**$2948.00**
LAT/TCP 3270	LE2416A-R2	**$3348.00**
RAM Configuration Card	LE2002A	**$199.00**
Upgrade Single/Dual Protocol	LE2001A	**$800.00**
Terminal Server SL Rackmount	LE2003A	**$59.00**
To connect your Terminals, you may need:		
Modular Adapter Thumbscrew Kit DB25/RJ-45, Male	FA770	**$9.95**

remember to order cables — Category 3, 4, and 5 Cable **See pages 68–70, 114–116.**

Trust Wireless Ethernet for Unique, *Reliable* Connections.

IN THIS SECTION...

Introduction 544
Pro Series Wireless Ethernet....................545
BestLAN 2.4 GHz and 900 MHz........546–547

Black Box Explains...

Why Go Wireless?

- It gives you flexibility to access your network computer system while roaming throughout your work area. It's an ideal solution for use in hospitals, conference rooms, warehouses, and airports! Anyplace you can carry a laptop becomes your work desk!
- It's great for communicating in harsh climates or in areas where it's prohibitively expensive to run cable. Wireless solutions are well suited for use in military applications, farming, refineries, mining, construction, and field research.
- Because sometimes you just can't run wire: like in historic buildings or hazardous material areas. When it's physically or legally impossible to support conventional hard-wired LANs, wireless networking may be your *only* answer.

FOR *FAST* TECH SUPPORT,
Call 412-746-5500

PRESS 1,2,4 LOCAL AREA NETWORK
High-Speed, Bridges and Routers, Remote Access, Wireless, Network Management, Ethernet, Token Ring, NetWare®, AppleTalk®, ARCNET® CD-ROM

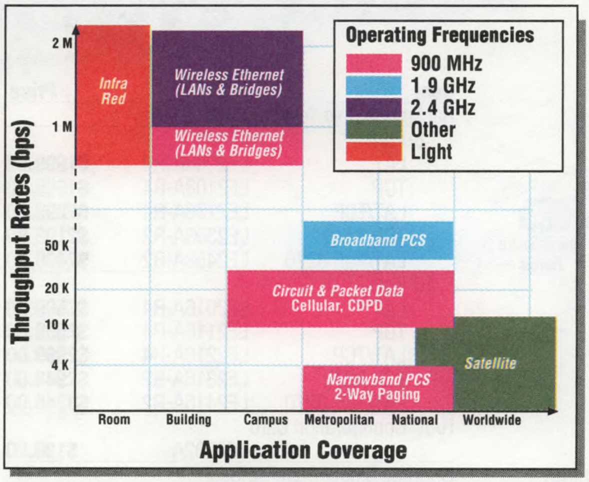
- For quick, temporary connections at trade shows, fast reconfigurations—even troubleshooting or remote field-testing.
- For reliable disaster relief—when all else fails! Count on wireless networks to maintain mission-critical links when disaster strikes.
- Best of all, no FCC licensing required!

Or if You Prefer:
Fax Us at: 412-746-0746.
E-mail Us at: info@blackbox.com

BLACK BOX SOLUTIONS One-Stop Shopping

"I'm still a bit unsure about Wireless Ethernet. What about integrity and security? Is wireless right for my application?"

First off, it's important to realize that wireless is a tried-and-true technology. The systems available today are based on proven techniques that have been refined over decades. It's not "bleeding-edge" technology and there's no reason to doubt it just because you can't see it.



Some Facts about Spread Spectrum:

Black Box supports two kinds of wireless spread-spectrum radio systems: Direct Sequence and Frequency Hopping. Both operate in the 2.4-GHz band, which enables them to support high-bandwidth applications while providing high reliability and reduced immunity to interference. Direct Sequence can also operate at 900 MHz.

The two techniques are incompatible, though, and there are some important distinctions to note between them:

Direct Sequencing is the most common wireless LAN type. It sends data redundantly over a 22-MHz bandwidth range from transmitters and receivers that use the same spreading pattern to decode the data, ensuring security. Transmitters can be tuned to five frequencies to avoid interference. And even if any data *is* lost, it can be rebuilt from other frequencies.

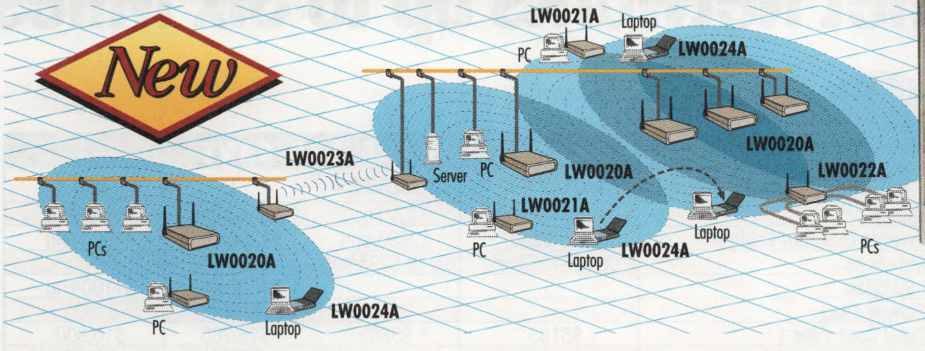
The **Frequency-Hopping** technique used in Pro Series Wireless Ethernet (**page 545**) divides available bandwidth into 78 1-MHz channels, broadcasting data in short, 400-ms bursts over one channel before hopping to the next.

Transmitters and receivers are synchronized to the same hopping pattern to ensure security. Any data lost to interference is simply retransmitted on a subsequent hop at a different frequency.

WIRELESS

Pro Series Wireless Ethernet

Wireless Ethernet Was Never *This* Easy!



BLACK BOX (412) 746-5500
Wireless PCMCIA Adapter
BLACK BOX (412) 746-5500
PWR
INFR
ETHR
LOAD
H
M
L
Wireless Access Point

- **Plug-and-play installation in any IEEE 802.3 Ethernet environment.**
- **Upgradable to the new IEEE 802.11 wireless LAN standard (when ratified) through TFTP download.**
- **Transparent to network protocols.**
- **High data rates—up to 3 Mbps.**
- **Long range: Up to 3000 feet (1000 meters).**
- **Up to 15 cells.**
- **SNMP management.**
- **Dynamic rate selection based on radio medium quality.**
- **Load-sharing support.**
- **High-speed roaming support.**

Now, wireless Ethernet is plug-and-play *and* economical. Plus, BLACK BOX® Pro Series Wireless Ethernet delivers the performance and versatility you demand to meet the needs of your growing network.

Simply Choose the Components You Need:

Access Points — Connect your wired Ethernet network to your wireless stations (a PC plus a Station Adapter). (The coverage area of an Access Point is known as a cell.)

Station Adapters — Attach these to the Ethernet connector (10BASE-T) of any workstation or PC and provide wireless connection to access points.

PCMCIA Adapters — Get wireless connections to an access point from the PCMCIA slot of any laptop or notebook computer.

Ethernet Bridges — Use a pair of Bridges to connect your wired Ethernet LAN to an access point in another building.

NOTE: All 3-Mbps Wireless Ethernet Hubs, Workstation Adapters, and Bridges can be factory upgraded to the Pro Series. Call Tech Support for more details.

FAXBACK INFORMATION
Request Document Number: 19015
Call 412-746-5500 Anytime

Why 3-Mbps Wireless Ethernet Is Better than Ever:

With the new Pro Series Wireless Ethernet from Black Box you get:

- Speed—it's *30% faster.*
- Updated Standards—It's designed to accept a software upgrade to meet the IEEE 802.11 wireless networking standard.
- Better Performance—A load-balancing feature keeps network traffic balanced between access points.
- Improved Management—Includes enhanced SNMP.
- IP Protocol Filtering—A new option for access points.

SPECIFICATIONS

Radio Specifications — Frequency-Hopping Spread Spectrum: 2.4–2.435 GHz (other ranges available for overseas use), 20–128 ms dwell time

Speed — Access Points, Station Adapters, Ethernet Bridges: Over the air: 1–3 Mbps; Nominal net: Up to 1.3 Mbps; PCMCIA Adapters: Over the air: 1–2 Mbps; Nominal net: Up to 1.6 Mbps; Aggregate: Over 15 Mbps with overlapped cells

CE Approval — All items listed are approved

Interface — 10BASE-T

Connectors — Access Points, Station Adapters, Ethernet Bridges: RJ-45; PCMCIA Adapters: PCMCIA Type II

Indicators — LEDs: Power On, Wired LAN Activity, Wireless LAN Synchronization/Radio Interference, Wireless LAN Signal Quality/Load

Power — 100–240 VAC, 60–50 Hz autosensing external power supply

Size — Access Points, Station Adapters, Ethernet Bridges: 5.1"H x 3.4"W x 1.2"D (13 x 8.6 x 3 cm); PCMCIA Adapters: 2.2"H x 5.4"W x 0.5"D (5.6 x 13.7 x 1.3 cm)

Weight — Access Points, Station Adapters, Ethernet Bridges: 1 lb. (0.5 kg); PCMCIA Adapters: 0.1 lb. (<0.1 kg)

Item	Code	Price
Pro Series Wireless Ethernet Units with Integral 2dBi Antennas		
Ethernet Access Point, Monitor Cable, Power Supply	LW0020A	**$1495.00**
Single-Port Station Adapter, Power Supply	LW0021A	**$695.00**
Four-Port Station Adapter, Power Supply	LW0022A	**$1195.00**
Ethernet Workgroup Bridge, Power Supply	LW0023A	**$1995.00**
2-Mbps Type II PCMCIA Adapter, Diversity Antenna, Software	LW0024A	**$565.00**
Units for Use with One or Two Detached Antennas		
Ethernet Access Point, Monitor Cable, Power Supply, Mounting Bracket	LW0025A	**$1495.00**
Single-Port Station Adapter, Power Supply, Mounting Bracket	LW0026A	**$795.00**
Four-Port Station Adapter, Power Supply, Mounting Bracket	LW0027A	**$1195.00**
Ethernet Workgroup Bridge, Power Supply, Mounting Bracket	LW0028A	**$1995.00**
Antennas and Accessories		
6-dBi Omnidirectional	LW011A	**$225.00**
8.5-dBi Unidirectional	LW012A	**$125.00**
24-dBi Directional	LW013	**$395.00**
7.2-dBi Omnidirectional Antenna, 20' Extension Cable, Mounting Hardware	LW0029	**$395.00**
12-dBi Directional Antenna, 20' Cable, Hardware for 1" to 2" Mast	LW0030	**$195.00**
18-dBi Directional Antenna, 30' Cable, Hardware for 1" to 2" Mast	LW0031	**$295.00**
In-Line Spurious Emissions Filter	LW0032	**$175.00**
Wall/Mast Bracket for up to Three OMNI-6, OMNI-7.2, or UNI-8.5 Antennas	LW0037	**$85.00**
Wall-Only Bracket for up to Three UNI-12, -18, or -24 Antennas	LW0038	**$95.00**
Power Supply for Access Points, Station Adapters, or Bridge	LW0039	**$36.00**
Extremely Low-Loss Extension Cable		
10'	LW0033	**$175.00**
20'	LW0034	**$245.00**
30'	LW0035	**$275.00**
50'	LW0036	**$315.00**
Monitoring Cable for Access Points, Station Adapters, or Bridge	LW0040	**$15.00**
If you're mounting an Antenna outside, order the:		
Lightning Arrestor	LW014	**$195.00**

BestLAN 2.4 GHz and 900 MHz

Connect Ethernet Networks up to Six Miles

- **Connect Ethernet networks up to 3–6 miles apart.**
- **2.2-dBi dipole antenna included.**
- **Point-to-point and point-to-multipoint functionality.**
- **Easy to install.**

BEST LAN: COMPARE AND SAVE

Features	BestLAN 900	BestLAN 2.4	T1	DDS
Speed	860 Kbps	2 Mbps	1,544 Mbps	56/64 Kbps
Remote Ethernet Bridge	$2495/end	$2695/end	$2300/end	$1900/end
Antennas	up to $195/end	up to $295/end		
CSU/DSUs			$1500/end	$1100/end
Annual Fees			$7680	$4800
Total Cost Year 1	$5185	$5685	$15,280	$10,800
Recurring Annual Costs			$7680	$4800

When you need unsurpassed flexibility and capability for building-to-building communications, think Black Box BestLAN Wireless Bridges.

BestLAN is the best buy.

Now you don't have to go through the expense and hassle of laying new cable or buying expensive dedicated phone lines. BestLAN Bridges are easier to use than microwave because of mirowave's high costs and FCC licensing requirements.

What are the advantages of BestLAN?

BestLAN features second-generation multi-channel Direct Sequence Spread Spectrum radio technology. It also incorporates industry-standard IEEE 802.1d Spanning Tree protocol.

Self-configuration and firmware upgrade from BOOTP facilities make installation and maintenance easy. Direct network connection eliminates the need for a dedicated PC for operation. Also for your convenience, you can control your BestLAN Bridge remotely from any workstation via Telnet™, FTP, or SNMP. An intelligent filtering feature ensures maximum efficiency.

BestLAN's sturdy one-piece design is at home in either the office or the factory. And the resident agent is compliant with SNMP MIB I and MIB II.

These bridges operate reliably under all weather conditions. And unlike immobile wired alternatives, they're easy to move as your needs change.

What is the speed of the connection?

You can get speeds up to 2 Mbps as long as you have a line of sight between buildings. With optional antennas you can send signals up to 6 miles away. Obstacles such as lakes, rivers, highways, and railroads are no longer hindrances. With BestLAN you can build networks where you couldn't before. All you need to make the connection are two BestLAN bridges.

Who can use BestLAN wireless bridges?

Any organization with multiple sites in a local area can benefit from the high-speed LAN connectivity that comes with BestLAN Wireless Bridges. All your users will be able to send and receive e-mail, access central applications, or share expensive peripheral services such as Internet access without relying on cable.

Wireless Bridges are perfect for school districts and universities, businesses with multiple sites, banks with multiple branches, local governments, factories, and warehouses.

How do you use the BestLAN Bridge?

Attach the BestLAN Bridge directly to a 10BASE2 (ThinNet), 10BASE5 (Thicknet), or 10BASE-T (Twisted-Pair) Ethernet LAN segments. These segments must conform to IEEE 802.3 specifications.

If you're trying to connect to a network that isn't Ethernet based, you can add an Ethernet segment by installing an Ethernet network interface card in the file server or Bridge.

The BestLAN Wireless Bridge comes in two models. Use the 2.4-GHz for shorter distances and higher throughput. Use the 900-MHz for longer distances.

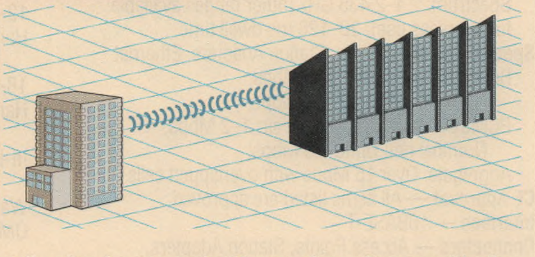
MORE! Wireless Ethernet Solutions, see pp. 544–545.

Black Box Explains...

BestLAN Antenna Configuration Options.

Point-to-Point

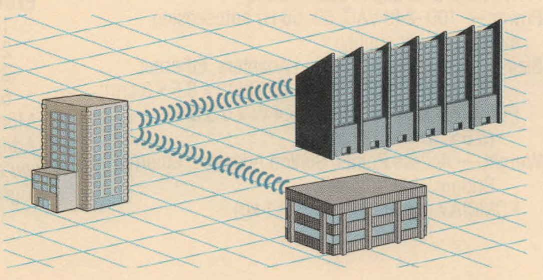
When you're connecting two sites with a pair of BestLAN wireless bridges, you have a number of options. If the distance is very short (several hundred feet), try the standard BestLAN 2.2-dBi dipole antenna (included).



For longer distances and outdoor mounting, use the 3-dBd omni-directional or directional antenna. And for very long distances (½ mile or more) you need directional high-gain Yagi antennas. Mount the antennas as high as possible and above obstructions such as trees, buildings, etc.

Point-to-Multipoint

If you're trying to connect with several remote locations, you need an omni-directional antenna at the main site and directional antennas aimed back at the main site from the remote locations.



—without Cable!

Perfect Applications.

Network Extension. Extend your network to a remote building whether it's a garage, a guardhouse, or a large remote office.

Temporary Remote Networks. If you're doing construction, setting up a temporary office, or working on a special project that requires your network to expand to include remote sites, BestLAN is what you need.

Internet Access. Interconnecting many sites for Internet access. BestLAN Wireless Bridges are capable of point-to-point and point-to-multipoint configurations.

A typical BestLAN-based **Internet** application consists of one site (the headquarters or a centrally located facility) equipped with a dedicated T1 or T3 link to an Internet service provider. BestLAN Bridges are then used to wirelessly connect the remaining buildings/locations within the same city or town to the dedicated T1 or T3 link to the Internet service provider. You own the link. So once your equipment is installed, you will have absolutely no ongoing monthly usage fees.

Installation's as Easy as 1, 2, 3...

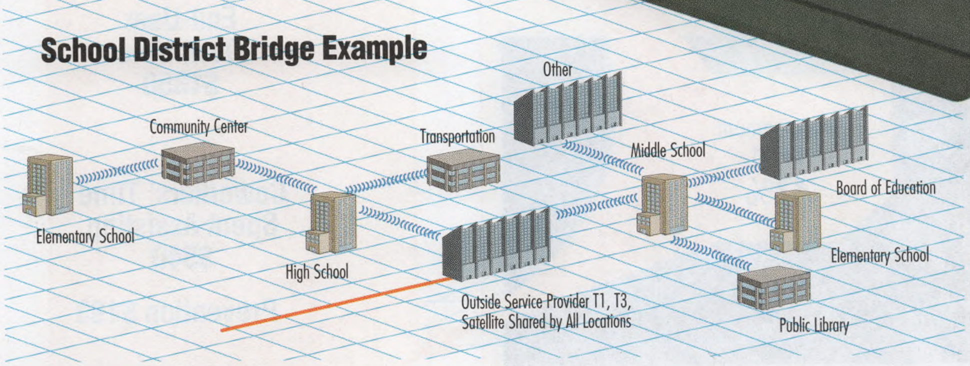
1. Plug the BestLAN Bridge directly into your Ethernet backbone—10BASE2, 10BASE5, and 10BASE-T connections are standard.
2. Set up your antenna (many short-range applications do not require an optional antenna).
3. Configure the bridge software via a console port: Telnet™, FTP, or SNMP.

New

LM600A-24

Speeds up to 2 Mbps!

School District Bridge Example



SPECIFICATIONS

Maximum Data Rate — LM600A-24: 2 Mbps; LM600A-900: 860 Kbps

Maximum Distance — LM600A-24: 3 mi. (4.8 km); LM600A-900: 6 mi. (9.6 km)

Maximum Throughput — LM600A-24: 1 Mbps; LM600A-900: 430 Kbps

CE Approval — LM630–633, 635, 637–639, 642–643, 646

Connectors — Ethernet (1) AUI DB15 female, (1) BNC, (1) RJ-45

Size — 1.9"H x 7.8"W x 5.9"D (4.8 x 19.8 x 15 cm)

Weight — 1.5 lb. (0.7 kg)

FAXBACK INFORMATION
Request Document Number: 17013
Call 412-746-5500 Anytime

Item		Code	Price
BestLAN Bridge	2.4-GHz	LM600A-24	**$2695.00**
	900-MHz	LM600A-900	**$2495.00**
2.4-GHz Antennas			
2.2-dBi Dipole		LM630	**$40.00**
3.0-dBd Omnidirectional Mastmount		LM635	**$85.00**
13.5-dBi Yagi Mastmount		LM631	**$295.00**
900-MHz Antennas			
2.2-dBi Dipole		LM637	**$40.00**
6.0-dBd Yagi		LM638	**$100.00**
3.0-dBd Omnidirectional Mastmount		LM639	**$155.00**
Accessories			
Bridge Mounting Kit (Wall or I-Beam)		LM642	**$40.00**
Yagi Articulating Mount		LM646	**$60.00**
20' Antenna Cable		LM632	**$75.00**
50' Antenna Cable (900 MHz only)		LM633	**$105.00**
Lightning Arrester		LM643	**$185.00**

Maximize Savings, Minimize Costs with the Right Desktop Management Solution.

In This Section...

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Windows NT/95.................................553
Optivity Network Management.................554
CONTROL! Network Management...........555
Novell NetWare® v.4.11 and v.3.12 556–557

Your network is running smoothly—so far. But what happens when problems arise, you're two hundred miles away, and no one on-site can handle them? Imagine the time and money you'll lose. That's where a Network Management System can help—giving you total control to eliminate the problems that can disrupt your network's performance.

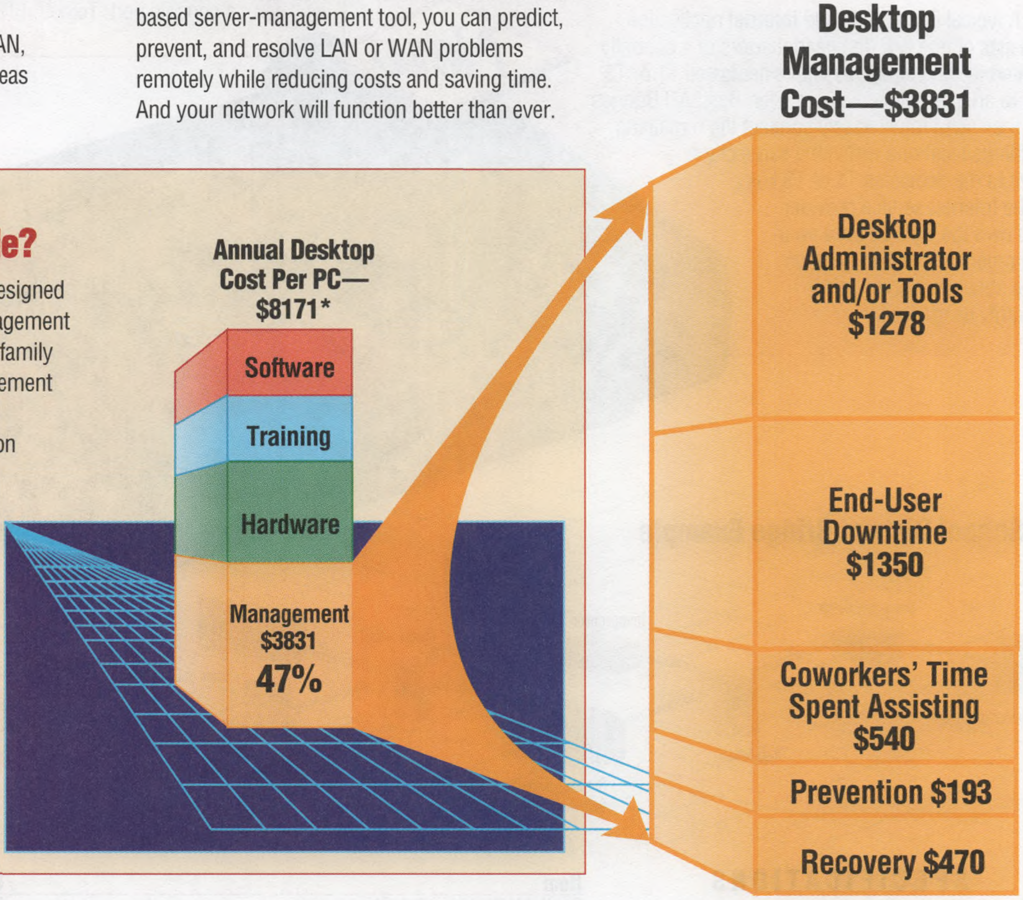
With the right Network Management System, you'll:

- Reduce downtime—a nuisance and an economic liability.
- Need fewer people to manage your LAN, so you can shift resources to other areas of your operation.
- Notice your remote sites—already a large revenue generator—are even more productive since you'll address problems immediately. You won't need to travel to the site or keep separate staffs at every remote location to resolve problems.
- Manage on-going network changes easily. Upgrading, standardizing, or simply adding equipment will be a breeze. Network Management keeps costs and time under control.

With a comprehensive hardware- and software-based server-management tool, you can predict, prevent, and resolve LAN or WAN problems remotely while reducing costs and saving time. And your network will function better than ever.

What Can Desktop Management Do for Me?

Our management solutions are designed to make both routine and crisis management quick and easy. The Intel® LANDesk® family covers the complete range of management options—from integrated LAN/WAN client/server control to virus protection to electronic software distribution. Plus, we have Novell® NetWare® v.4.11 and v.3.12. With these choices you can get exactly what you need to keep your network running smoothly without spending—or losing—a fortune.



*Source: Forrester Research, "Managing Unruly Desktops," 1995

FOR *FAST* TECH SUPPORT,
Call **412-746-5500**

PRESS **1,2,4** LOCAL AREA NETWORK
High-Speed, Bridges and Routers, Remote Access, Wireless, **Network Management**, Ethernet, Token Ring, NetWare®, AppleTalk®, ARCNET®, CD-ROM

Or if You Prefer:
Fax Us at: 412-746-0746.
E-mail Us at: info@blackbox.com

It's the Costs You Don't See that'll Kill You!
You know how much you pay for your network, your PCs, and your software. Do you know how much you pay to maintain them? According to a study by Forrester Research, 47% of average PC costs are from personnel costs for downtime, troubleshooting, and routine maintenance.

NETWORK MANAGEMENT

Intel LANDesk Management Suite

Our Most Capable and Comprehensive System-Management Package.

- **Award-winning technology for full-featured integrated management.**
- **Extends popular network-management platforms.**
- **Manages all Intel architecture-based PCs and servers.**
- **Complete management for up to five file servers and unlimited PCs.**
- **Integrated package enables you to control PCs and servers in your multi-NOS environment.**

Intel LANDesk Management Suite v 2.51 Setup
intel
Intel LANDesk Management Suite
Integrated multi-NOS management for PCs and servers.
intel

Now from Black Box: Control all the PCs and servers in your multi-NOS environment with award-winning management software from Intel®.

The LANDesk® Management Suite is a full-featured management solution that provides single-point control across the Intel architecture. You get a complete set of applications including software distribution and metering, server-based event handling, and integrated reporting.

LANDesk Management Suite saves you time and helps you lower your overall network administration costs—the moment you install it!

- **Software Distribution**—Distribute software automatically using lists created from the inventory database.
- **Software Metering**—Real-time software metering ensures accurate software-asset management and accounting including sharing licenses between servers on WANs.
- **Server-Based Event Handling**—Tracks critical alerts on remote servers, even from other management platforms, and passes them to a centralized server.
- **DMI Support**—By supporting the industry-standard Desktop Management Interface (DMI), LANDesk Management Suite enables you to manage your hardware remotely without having to locate or learn each vendor's configuration program.
- **Integrated Reporting**—You can combine historical reports with real-time information for print usage, wire activity, server statistics, alerting—and more!

MORE! Intel® Products, **see pp. 495–496, 498, 536, 550–552, 568, 580, 599–600.**

SYSTEM REQUIREMENTS

for Management Servers

- Novell® NetWare® 3.11, 3.12, 4.02, or 4.1.
- 4 MB of system memory dedicated to the Management Suite NLMs.
- At least 24-MB total system memory (for servers only running NetWare and Management Suite).
- 20-MB free disk space for the Management Database.
- 75-MB disk space for the Management Suite software.
- An account on the SYS volume with SUPERVISOR or ADMIN equivalent rights.
- Btrieve® version 6.10c. If running Windows® 95, you must have Windows 95 6.15 requester.
- TCP/IP to manage Windows NT™ servers.

for Management Workstations

- 25-MHz 80486 IBM® compatible or better.
- VGA or Super VGA graphics adapter and monitor.
- 12 MB of system RAM.
- 10 MB of local hard-disk space for local data gathering.
- NIC with an ODI™ device driver capable of operating in promiscuous mode.
- Microsoft® Windows 3.1x running in enhanced mode, configured for NetWare or Windows NT networking.
- Novell NetWare Client for DOS/Windows 1.2 or later (or equivalent if running Windows 95).
- LSL.COM version 2.02 or later.

Top 4 Reasons to Order Intel LANDesk Management Suite:

- Integrated management for networks with a range of servers, clients, workgroups, and multiple LAN/WAN domains.
- Complements and extends popular network management platforms.
- DMI support gives quick access to critical PC information, including inventory-access domains and NOSs.
- Server monitor tracks performance and triggers alerts when critical thresholds are crossed.

FAXBACK INFORMATION
Request Document Number: 17611
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LAN MAGAZINE 1995 PRODUCTS OF THE YEAR

PC MAGAZINE BEST OF '95

Intel LANDesk Management Suite Awards...

MVP 1995 WINNER PC Computing

PC MAGAZINE EDITORS' CHOICE

Item	Code	Price
Intel LANDesk Management Suite		
5-Node License	LDMS5V251	**$750.00**
10-Node License	SLAN150010V25	**$595.90**
100-Node License	SLAN15001HV26	**$6250.00**
1000-Node License	SLAN15001KV27	**$50,000.00**

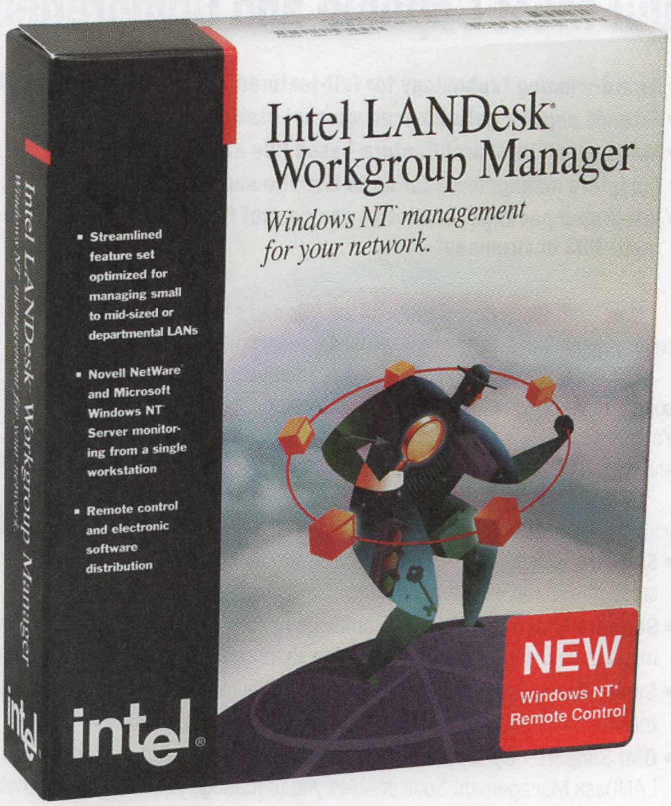
Intel LANDesk Workgroup Manager

Simple Multi-NOS Management for Workgroups.

- **Get remote control of all areas of your network from one Windows NT console—move files, run programs, and make configuration changes.**
- **Perfect for managing small to medium LANs or workgroups.**
- **Take total control of your workgroup easily—with minimal training.**
- **Get key management functions without added complexity.**
- **Now comes with SQL database!**

EXPERT TECHNICAL SUPPORT

24 HOURS A DAY
7 DAYS A WEEK
412-746-5500


Intel LANDesk® Workgroup Manager
Windows NT® management for your network.
Streamlined feature set optimized for managing small to mid-sized or departmental LANs
Novell NetWare® and Microsoft Windows NT Server monitoring from a single workstation
Remote control and electronic software distribution
Intel LANDesk Workgroup Manager
Windows NT management for your network
NEW
Windows NT® Remote Control
intel

Managing a LAN or workgroup calls for straightforward simplicity. You want rock-solid tools that work for your most common management tasks. With LANDesk® Workgroup Manager you get a streamlined feature set so you can get control of your network fast and solve problems easily—without the costs and installation headaches of full-size management systems. LANDesk Workgroup Manager is the perfect solution!

Although smaller in scope than LANDesk Management Suite—on which it's based—LANDesk Workgroup Manager handles all the basics, including remote client control, electronic software distribution, server monitoring, workstation inventory, and diagnostics. The Workgroup Manager ensures servers and workstations remain up and running, resolves problems as they develop, and keeps LAN administration costs low.

It's also easy to install and flexible, supporting both Novell® NetWare® servers and clients, and Microsoft® Windows NT™ servers and workstations, from a Windows NT host. It also supports Windows® for Workgroups, Windows 95, Windows 3.x., and DOS clients.

MORE! Intel® Products, see pp. 495–496, 498, 536, 549–552, 568, 580, 599–600.

Performs Key Management Functions Such As...

- **Electronic Software Distribution**—Gets applications to users quickly and efficiently.
- **Server Monitoring**—Helps you follow critical parameters and statistics to anticipate problems and reduce downtime.
- **Remote-Control Diagnostics**—View workstation parameters and data, and access video, keyboard, and mouse control from a remote location to diagnose problems.
- **Inventory**—Create a database of all your client hardware and software for an accurate account of all materials.

SYSTEM REQUIREMENTS:

for Management Server

- Windows NT server or Windows NT workstation 3.5x
- 32-MB RAM
- 50-MB available disk space
- An account with administrator rights

for Management Workstation

- Windows NT server or Windows NT workstation 3.5x
- 2-MB available disk space
- An account with administrator rights

FAXBACK INFORMATION
Request Document Number: 17628
Call 412-746-5500 Anytime

Item	Code	Price
Intel LANDesk Workgroup Manager 25-Node License	LDWMV11	**$999.00**

Intel LANDesk Server Manager Pro

Complete Management for PC Servers.

- Comprehensive, nonproprietary protection.
- Proven hardware and software technology to manage critical server events locally and remotely.
- Supports Novell® NetWare® and Microsoft® Windows NT™, and provides remote control of their servers.
- Automated event management provides early warnings of potential server failure.
- Automated initiation of emergency procedures resolves critical problems before they can bring down the server.
- Realtime monitoring prevents crashes from destructive elements such as high server temperatures or power fluctuations.
- Configurable hardware settings detect emergencies, control damage, and initiate server shutdown and power-up.
- Ongoing data gathering helps administrators determine baselines, trends, and significant events.
- DMI-enabled for management from any DMI Management Console, includes SMI Service Layers for NetWare and Windows NT.

Intel LANDesk Server Manager Pro
Complete management for servers.
NEW
Windows NT® Remote Control

MORE! Intel® Products, **see pp. 495–496, 498, 536, 549–552, 568, 580, 599–600.**

With Intel® LANDesk® Server Manager Pro, PC LAN and Server problems can virtually be eliminated—even if you're controlling your network from a remote location. And that means you can virtually eliminate downtime—saving your valuable time, money, and resources.

If your server is functioning, manage your server in-band through a single console to control and prevent problems before they disrupt your LAN's activity. Or if the server or network is down, manage the server out-of-band through a modem and solve the problem before it causes serious network damage.

Regardless of how you connect, Server Manager Pro traces hundreds of parameters on your NetWare and Windows NT servers. If you're in-band, you can use the graphical parameter display for complete troubleshooting capabilities. If you're out-of-band, simply follow your module's commands.

This network management tool provides remote fault notification for out-of-band alerting. And, you can turn your server's power off and on from a central console.

BUYER'S GUIDE

COMPATIBILITY LISTING

PC Server System	NetWare	Windows NT
AcerPower	✓	✓
AST® Premmia GX P/90	✓	
Compaq® ProLiant 1500	✓	✓
Compaq ProSignia VS	✓	
DEC™ Prioris HX 590	✓	✓
DEC Prioris XL Server	✓	
Gateway® 2000 P90	✓	
HP® NetServer 5/66 LC	✓	✓
HP NetServer 5/100 LM	✓	

SYSTEM REQUIREMENTS:

- Novell NetWare 3.11, 3.12, or 4.1.
- Intel 486™ or Pentium® processor-based server.
- 16-MB RAM.
- 30 MB of available disk space.

or

- Microsoft Windows NT 3.5x.
- Intel 486™ or Pentium® processor-based server.
- 24-MB RAM.
- 15 MB of available disk space.

FAXBACK INFORMATION
Request Document Number: 17635
Call 412-746-5500 Anytime

Item	Code	Price
Intel LANDesk Server Manager Pro	LDSMV251	$1495.00

Intel LANDesk® Virus Protect
Centrally managed, enterprise-wide virus protection.
Intel LANDesk® Virus Protect
User's Guide
intel

Intel LANDesk Virus Protect for NetWare servers is a Novell certified NLM!

Intel LANDesk Virus Protect (for NetWare and Windows NT)

Centrally Managed, Enterprise-Wide Virus Protection.

- **Virus firewall offers unmatched protection for your servers and desktops.**
- **Comprehensive solution for servers, workstations, PCs, and portables.**
- **Centralized management simplifies installation, updates, and maintenance.**
- **Supports realtime, on-demand, or scheduled scanning for reliable protection.**

Use these new Intel® LANDesk® Virus Protect packages to create an impenetrable virus firewall for comprehensive protection of your NetWare® or Windows NT™ servers. The Integrity Shield protects critical files from modification while Clean Room certification assures that no infected files remain on the server and realtime scanning prevents infected files from being copied.

Virus Protect supports single-step configuration of entire server domains. Centralized alerting and reporting provides detailed reports to integrate enterprise-wide information, and a broad range of notification methods helps you detect viruses. An integrated event log even provides detailed information on the origins of virus infections. And LANDesk Virus Protect software enables you to configure entire server domains in a single step.

Call today to find out more about this data-saving Black Box Plus Intel Advantage. Your network can't afford to wait one minute more.

intel® *from* BLACK BOX

Get FREE Software Updates!

Get FREE virus pattern updates! Check the Intel BBS for scheduled updates or get instant pattern updates on the Internet.

FAXBACK INFORMATION
Request Document Number: 17642
Call 412-746-5500 Anytime

Item	Code	Price
LANDesk Virus Protect		
For NetWare Server	SLAN1218V301	**$746.25**
For Windows NT Server	LDVPNTV17	**$1495.00**

MORE! Intel® Products, **see pp. 495–496, 498, 536, 549–551, 568, 580, 599–600.**

Intel LANSchool

Turns Your Network into a Virtual Classroom!

- **Broadcast an instructor's computing session to any number of student workstations on a LAN.**
- **The shared session is completely live, including screen, mouse inputs, and keystrokes.**
- **No TSR required for Windows® classrooms.**
- **Run up to 16 concurrent classes with an unlimited number of students per class!**
- **Supports bindery, bindery emulation, and NDS modes of NetWare.**

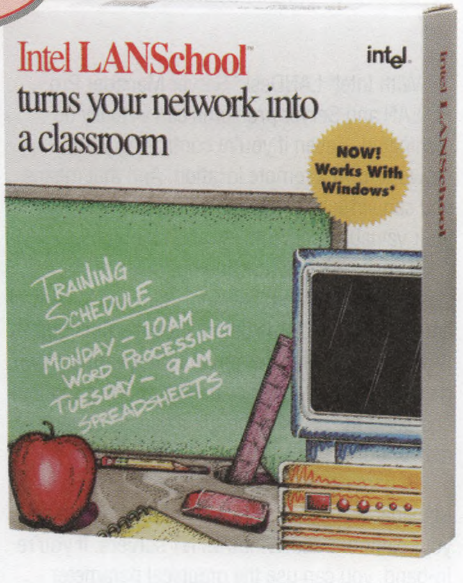
LANSchool® by Intel turns any Novell® network into a computerized classroom environment—in just minutes—with no additional hardware or cabling. Instructors can broadcast their screen, mouse input, and keystrokes to their students—creating interactive working models for the class. LANSchool is the ideal solution for networks where training or demonstrations are important—in other words, your network!

Here's How LANSchool Works:

Instructors initiate a training session by clicking on the "Windows Teacher" icon. Instructors can then broadcast their screen, mouse input, and keystrokes to students in their classroom. Students receive broadcasts from the instructor by clicking on the "Windows Student" icon. Student workstations can be configured to give complete control to the instructor or to give students the ability to experiment with the instructions they receive over the network. With another click of the mouse, instructors stop broadcasting and student workstations are restored to their individual computing sessions.

SYSTEM REQUIREMENTS

- NetWare 2.0 or later.
- Windows 3.1, 3.11, or Windows for Workgroups 3.11.
- VGA or SVGA graphics adapter.
- Novell WINUP9 Windows Update Kit for VLM and NETX.
- No TSR required.


Intel LANSchool
intel
turns your network into a classroom
NOW! Works With Windows®
TRAINING SCHEDULE
MONDAY - 10AM WORD PROCESSING
TUESDAY - 9AM SPREADSHEETS
Intel LANSchool

FAXBACK INFORMATION
Request Document Number: 17659
Call 412-746-5500 Anytime

Item	Code	Price
Intel LANSchool	SLAN1223V40	**$795.00**

CiscoWorks Windows 2.1 for Windows NT/95

Complete Management Solutions for Every Network Environment.

- **Windows based installation for quick setup.**
- **Complete SNMP-based management capabilities—from a single system—for small-to-medium Cisco networks.**
- **Offers graphical, realtime display of device, port, and network statistics, and color-coded mapping and alarm system for easy diagnostics and troubleshooting.**
- **Compatible with other SNMP devices and management systems.**
- **Customize management solutions based on your network activity for increased flexibility and efficiency.**
- **Incremental Device Installer enables users to add management support on an as-needed basis.**

New

SYSTEM REQUIREMENTS

Hardware

Pentium® based IBM® PC or compatible
24-MB RAM memory
45 MB of free disk space for standard installation
CD-ROM for installation
SVGA monitor and color adapter
NDI- or ODI-compliant network interface card

Software

Windows 95 v4.0 or Windows NT v3.51
WinSock-compliant TCP/IP stack

CISCO SYSTEMS
PARTNER
PREMIER RESELLER
PENNSYLVANIA

With the diversity of networks today, you need a comprehensive management tool that works with all your networking equipment. CiscoWorks™ Windows® 2.1 for Windows NT™/95 provides you with the management capabilities you need to control all your router, switch, and access-server configurations.

Control and monitor your entire network with one management console from one location. Graphical color-coded displays enable you to monitor and record the status of every product across the network so you get instant updates on port status, bandwidth utilization, traffic statistics, and protocol information.

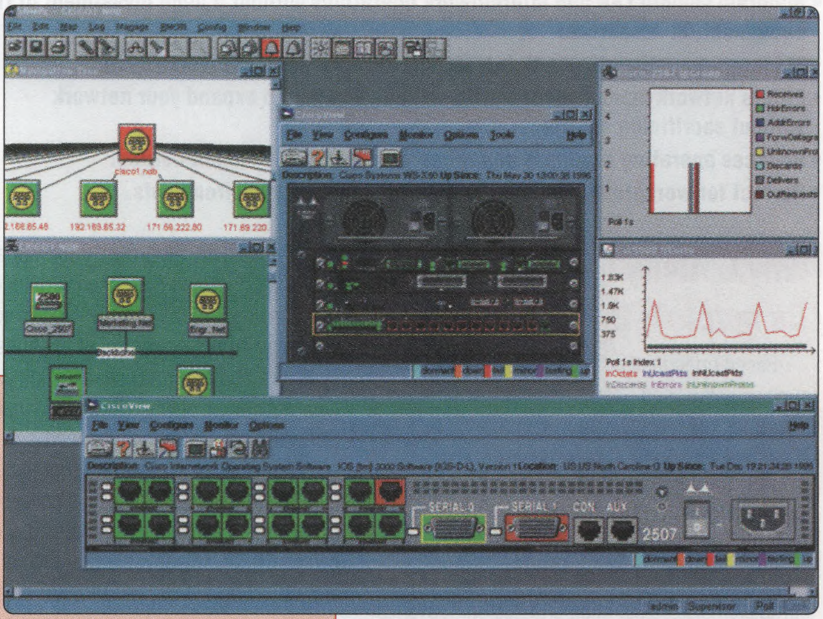
You can customize CiscoWorks to meet your individual management needs and automate tasks, set threshold performance values, and condense specific information into user-friendly tables.

The Management Information Base (MIB) enables you to manage any SNMP device on your network. That means you can use CiscoWorks independently or integrate it with any other SNMP-based management platform.

Use Configuration Builder to create and distribute configuration files using graphical tools instead of complicated command sets. And this tool makes use of the features offered by Cisco IOS℠.

Your Package Contains:

- CiscoWorks Windows 2.1 CD-ROM
- CiscoWorks Windows Getting Started Guide
- Incremental Device Install Guide
- Castle Rock Computing SNMPc 4.1 CD-ROM
- SNMPc Network Management Reference Guide



Supports These Cisco Routing and Switching Products:

Routers—

- Cisco 7500 and 7000 Series with RSP, VIP, FEIP, and CIP Processing Modules
- Cisco 4500 and 4000 Series with Processing Modules
- Cisco 2500 Series: Models 2501–2516

Switches—

- Catalyst Switches and Workgroup Concentrators: 1000, 1100, 1200, 1400, 1600, 1700, 2100, 2800, 3000 (with modules WS-X3001–X3005), and 5000 (with FDDI/CDDI adapters)
- ATM Switches: LS100 and LS2020 Series
- CiscoPro Switches: CPW500, CPW1100, CPW1200, CPW1400, and CPW1600 (with cards 100T, 280, 310F, 410T, and 800), EPS2015, and CPW2115 (with cards 115, 253, 254, and 255)

FAXBACK INFORMATION
Request Document Number: 18478
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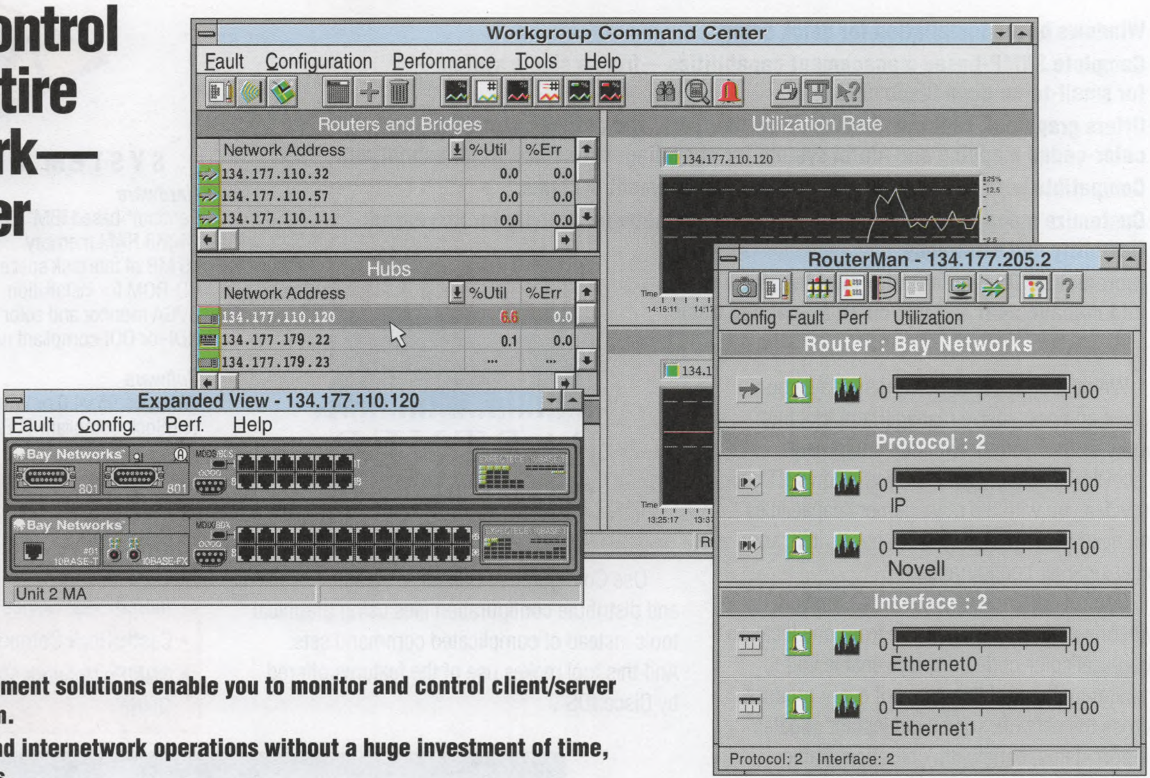
Item	Code	Price
CiscoWorks Windows 2.1 for Windows NT/95		
50-User	CWPC-2.1-WIN-SMO	**$1295.00**
500-User	CWPC-2.1-WIN	**$2495.00**

Optivity Network Management Software

Complete Network Control for Your Entire Bay Network—or Any Other Network.



Workgroup Command Center

Routers and Bridges

Network Address	%Util	%Err
134.177.110.32	0.0	0.0
134.177.110.57	0.0	0.0
134.177.110.111	0.0	0.0

Hubs

Network Address	%Util	%Err
134.177.110.120	6.6	0.0
134.177.179.22	0.1	0.0
134.177.179.23	...	...

RouterMan - 134.177.205.2

Router : Bay Networks

Protocol : 2 — IP, Novell

Interface : 2 — Ethernet0, Ethernet1

Protocol: 2 Interface: 2

Expanded View - 134.177.110.120

Unit 2 MA

- **Graphics-based management solutions enable you to monitor and control client/server traffic from one location.**
- **Maintain smooth LAN and internetwork operations without a huge investment of time, equipment, or resources.**
- **Manage your network as a tightly integrated enterprise of diverse devices.**
- **Filters network management traffic and enables you to expand your network without sacrificing control.**
- **Reduces operating expenses and relieves overall management burden.**
- **Perfect for workgroup, campus, or enterprise network environments.**

Why Optivity?

Complete Interoperability.

Based on industry-standard protocols such as SNMP and RMON, the Optivity family integrates completely with most other Bay Networks products—or any other group of network products. You can manage your entire network from one location, from one station, and solve every problem you may encounter—from simple control of smaller LANs to complete network planning and design. It even reduces overall management traffic so you can expand your LAN/WAN without losing management capabilities. What else do you need for complete control and monitoring capabilities at your fingertips?

As your network grows, your management needs change. And that means you need a system that can adapt to the changes you make *and* that gives you complete control of the hubs, routers, switches, and other devices that link users within your network. Optivity® Network Management Software is the solution you need.

With Optivity in place, you get the tools you need to manage your LAN as a collective unit—not as a group of unrelated devices. You can enable and disable parts of the network, detect and report problems, and monitor data flow from a single workstation. No more repeated visits to wiring closets, network centers, or remote offices.

The Optivity Enterprise Command Center provides a quick, concise view of all sites within your network. Reconfigure your network easily with a simple "drag-and-drop" mouse operation. Just create a new workgroup on your management console and then add the resources you need. Optivity changes the hub's backplane to ensure management capabilities continue uninterrupted.

Integrate Optivity with your current network of Bay Networks™ products or with any other existing products you have. Optivity evolves as your network evolves so you can buy it today and upgrade your system as needed to maximize your investment.

CE Approved — All items listed are approved

FAXBACK INFORMATION
Request Document Number: 18519
Call 412-746-5500 Anytime

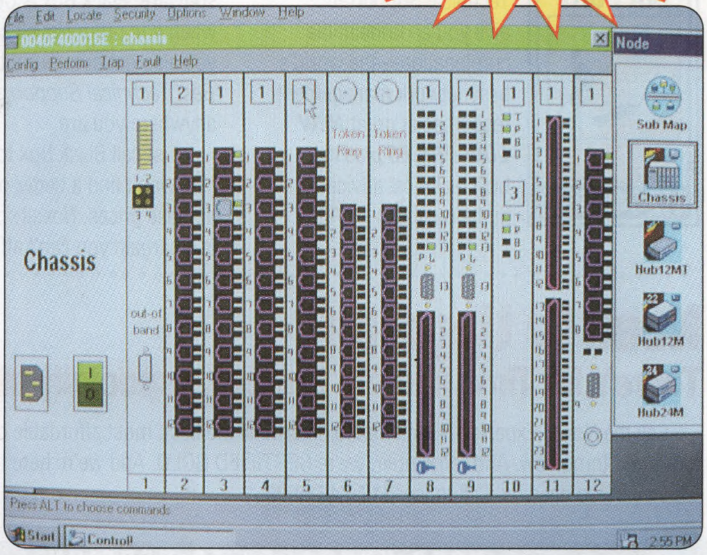
Item	Code	Price
Optivity Network Management Software		
Optivity Workgroup–EZ LAN Windows®	600	$99.00
EZ Internetwork Windows	76024	$99.00
Optivity Campus		
Novell Managewise	620-1	$3495.00
HP® OpenView® Windows	636-03	$2595.00

CONTROL! Network Management Software

Manage Your Entire Network—in Realtime—with This Super-Versatile SNMP Program.

Full SNMP Compliance and More!

- **Manages systems in-band via the network or out-of-band through an async RS-232 port.**
- **Has an easy-to-use graphical user interface (GUI). Operates under Windows® 95 or DOS.**
- **Manages all aspects of your intelligent hubs and switches—including configuration, performance, security, faults, traps, and accounting.**
- **Monitor Ethernet and Token Ring parameters on every port in realtime.**
- **Follows the industry-standard SNMP protocol for management of a multi-vendor network.**
- **Automatically discovers the network topology including intelligent hubs, switches, and nodes.**
- **Makes network changes easily. Download software directly into flash EPROM.**
- **Features polling timer, threshold alarms, and trap and alarm level settings.**
- **Prevents or locks out specific MAC addresses.**



If you need to manage Ethernet or Fast Ethernet devices, CONTROL! Network Management Software is your most powerful tool. Now you can gather vital network information, monitor data traffic, and control and analyze network activity in realtime—without delays.

The autodiscovery feature identifies and displays all intelligent hubs, switches, PCs, and other nodes in a graphical diagram for visual reference of network topologies. You can use this feature for troubleshooting and management of your entire network. Plus, you can view performance statistics in either graphic or tabular form.

Windows® 95 Graphical User Interface (GUI) gives you easy access to all aspects of your managed hubs, switches, and other SNMP network equipment. You can manage your LAN either in-band via the network or out-of-band through an async RS-232 port. For added security, all Network Management functions can be accessed only with a password.

You can also use CONTROL! to enable and disable ports, attach or detach hubs, and isolate sections of the network.

Bonus Management Functions:

When you use CONTROL! with the BLACK BOX® SuperHub 1200 (**p. 567**), or the Stackable Super Hubs (**p. 566**), you get these bonuses! You can:

- Actually see a graphic representation of the Hub including all ports.
- Monitor all ports in real time!
- Just point and click to change and monitor performance, traps, faults, security, etc.
- Get complete system module configuration information.

SPECIFICATIONS

Platform — DOS/Windows 95;
8-MB minimum
Protocol — SNMP, SLIP, TFTP, PING

FAXBACK INFO
Request Document Number: 16830
Call 412-746-5500
Anytime

Item	Code	Price
CONTROL! Network Management Software	LS3000A	**$599.00**

Black Box Explains...

SNMP.

SNMP (Simple Network Management Protocol) management is *the* standard for LAN management, particularly in mission-critical applications. The Internet Engineering Task Force (IETF) governs the SNMP standard. In evaluating network-management systems, SNMP compliance has emerged as a crucial factor. SNMP was designed to manage network configuration, performance, faults, accounting, and security.

An SNMP agent must be present at the device level (a Router or Hub, for example), either built into the unit or as a proxy agent, and is accessed through a remote terminal. SNMP does not follow a polling protocol. It waits to receive data from the remote device or it sends data based on operator commands.

By using one common set of standards, SNMP enables network administrators to manage, monitor, and control their SNMP-compliant network equipment with one management system, and from one management station. If a network device goes down, it's possible to both pinpoint and troubleshoot the problem more efficiently. And a network administrator isn't limited to equipment from just one vendor when using an SNMP program. However, it's critical that the multi-vendor equipment fully complies with the SNMP standard for complete network management.

What's the Best Way to Get FREE Technical Support

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We combined world-famous Novell® software with legendary Black Box Technical Support to give you an unbeatable combination—the world's best network management resources at great ***NEW LOW PRICES*** *plus* the best technical advice in the business—*FREE!*

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Just call Black Box for ***Software with Service.*** You won't find a better offer or better advice. And at these prices, Novell software from Black Box is a bargain you can't afford to pass up.

NetWare v.4.1

The Next Generation... The Industry's BEST *New* Tool for WAN Management.

Create. Modify. Change. Record.

NetWare® is the *one* management tool that helps you do it all—from anywhere on your wide-area network. And this new version gives you more options—more flexibility—to make the important network-management decisions and choices—whenever and wherever you need.

Log in just once to access all network resources. New WAN services make transferring information across large networks faster and far more efficient than ever before.

Includes NetWare Directory Services (NDS), a distributed database that offers global access to all network resources regardless of their physical location.

NetWare seamlessly integrates today's most popular operating systems—Windows®, OS/2®, Macintosh®, UNIX®, and DOS—so it's practically perfect for any environment. Call the Black Box Technical Experts TODAY to find out more.

Want to upgrade to NetWare 4.1? Use the handy Upgrade Chart **at left.**

* * *

Need to Upgrade?

There's No Time like the Present. Especially at These Prices.

Call the Novell Experts at Black Box to determine the best, most affordable option for your network—today and tomorrow. And remember, we're CERTIFIED GOLD. And we're here to assist you—*FREE*—whenever you need us. Call today: **412-746-5500.**

BUYER'S GUIDE

USER UPGRADES TO VERSION 4.1

	To NetWare v.4.1 CD					
Any NetWare Version	**5-User**	**10-User**	**25-User**	**50-User**	**100-User**	**250-User**
5-User	$495	$1895	$3095			
10-User		$995	$2195	$3495		
25-User			$1495	$2795	$4795	
50-User				$1995	$3995	$9495
100-User					$2795	$8295

BUYER'S GUIDE

USER UPGRADES TO VERSION 3.12

	To NetWare v.3.12					
Any NetWare Version	**5-User**	**10-User**	**25-User**	**50-User**	**100-User**	**250-User**
5-User	$495	$1895	$3095			
10-User		$995	$2195	$3495		
25-User			$1495	$2795	$4795	
50-User				$1995	$3995	$9495
100-User					$2795	$8295

FAXBACK INFORMATION
For More Information and Pricing: 16043
Call 412-746-5500 Anytime

Just Look at the Titles We Have in Stock...

- **NetWare SFT III v.4.1**

  This add-on service to NetWare 4.1 provides fault-tolerance for your WAN by enabling you to configure multiple network servers into a widespread mirrored server system, providing backup support for up to 1000 users.

- **LAN WorkPlace 5 for Windows and DOS**

  Enables PCs to access TCP/IP resources such as UNIX minicomputers, DEC™ VAX™, and IBM® mainframes. Provides management access from anywhere on a PC network.

- **LAN WorkGroup 5**

  The newest version of this popular management tool is a server-based solution that delivers TCP/IP and Internet access right to your users' desktops. It includes Netscape Navigator® and an intuitive graphical interface so users can navigate the Web with point-and-click ease.

- **NetWare NFS Gateway**

  Enables NetWare users to access fields residing on UNIX systems. NetWare users require no additional training since UNIX file directories are presented as NetWare volumes. Windows and DOS users get transparent file access to NFS.

Need Help? Call *ANYTIME* When You Buy from Black Box!

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Need a Novell solution that's not listed here? *We can get it for you! Call Black Box* ***NOW!****—Your #1 stop for TOTAL Novell networking.*

for Novell Software? The Black Box Way...

NetWare v.3.12

The Right Choice for Managing Your Enterprise.

This 32-bit network operating system seamlessly integrates diverse desktop and host environments, enabling Mac®, UNIX®, Windows®, OS/2®, and DOS users to access files and hardware resources in their chosen environment.

This enterprise-level version of NetWare® will grow with your system as it evolves from one to multiple servers.

This version features many new features including online documentation and built-in management.

Want to upgrade to NetWare v.3.12?

See the handy chart on **page 556**.

1 Operating System
4.1
NOVELL. NetWare 4
NETWORK COMPUTING PRODUCTS
High Performance Network Operating System for Multiserver Network Environments
Installation
High Performance Network Operating System

LAN WorkPlace 5 for Windows and DOS (1-User) only ***$345.00***

NetWare 4.1 (5-User) only ***$695.00***

NetWare 3.12 (5-User) only ***$695.00***

Personal NetWare (1-User) only ***$79.00***

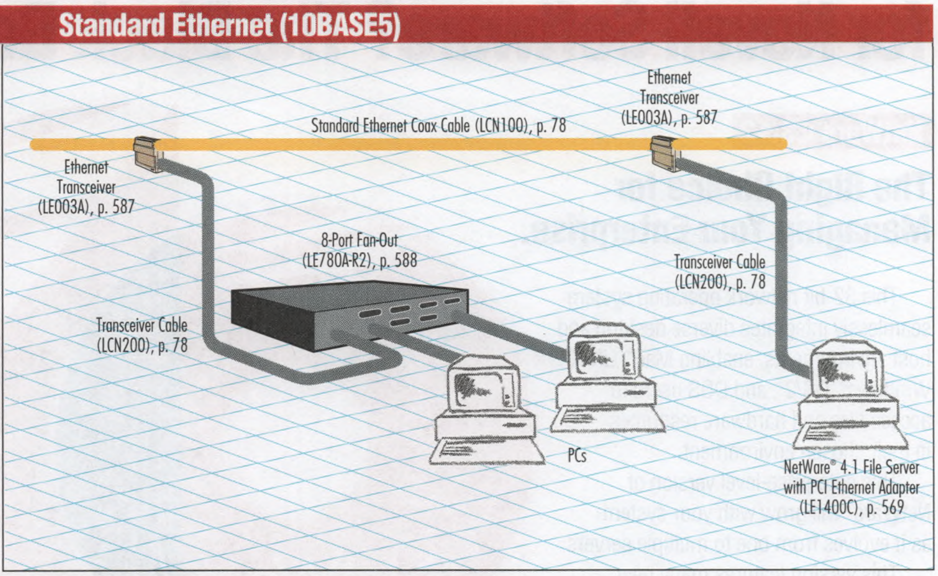
Besides total technical support, Black Box also offers the most complete selection of packages with a range of multi-user options—whether you need to network *1 or 1000* workstations!

- **Personal NetWare™**
  This peer-to-peer NetWare version supports workgroup connections in a LAN environment, but it's also a perfect-sized solution for small businesses. A very cost-effective option.
- **NetWare Connect**
  Presents a single platform for managing remote access. Supports outbound communication, mobile users, and other multiple connectivity options with just one interface.
- **NetWare Multiprotocol Router**
  Connects NetWare servers at branch offices with services at your headquarters. Offers instant access to information and resources anywhere.
- **NetWare for Macintosh**
  Enables Macintosh® users to share files and network resources with other Mac users, DOS, OS/2, UNIX, and Windows clients. A must for integrating Mac in multiplatform environments.
- **NetWare NFS & FLeX/IP**
  Enables UNIX users to access NetWare files *and* printers, *plus* share files with any NetWare client from their workstation's native environment.
- **NetWare/IP**
  Run NetWare applications and access NetWare services in a TCP/IP environment. With NetWare/IP onboard, most NetWare applications based on IPX™ can operate seamlessly.
- **NetWare for SAA**
  This package integrates NetWare for use in IBM® and AS/400® environments. Developed as an NLM, this software takes advantage of the high performance of NetWare and its reliability, security, and manageability, and is perfect for small branch offices.
- **ManageWise**
  Choose this integrated set of management services to monitor and control your network from end to end. Track activity on user desktops, servers, even your network infrastructure. ManageWise is a completely scalable solution for large *or* small networks.

Standard Ethernet (10BASE5)

Standard ("Thick") Ethernet (10BASE5)

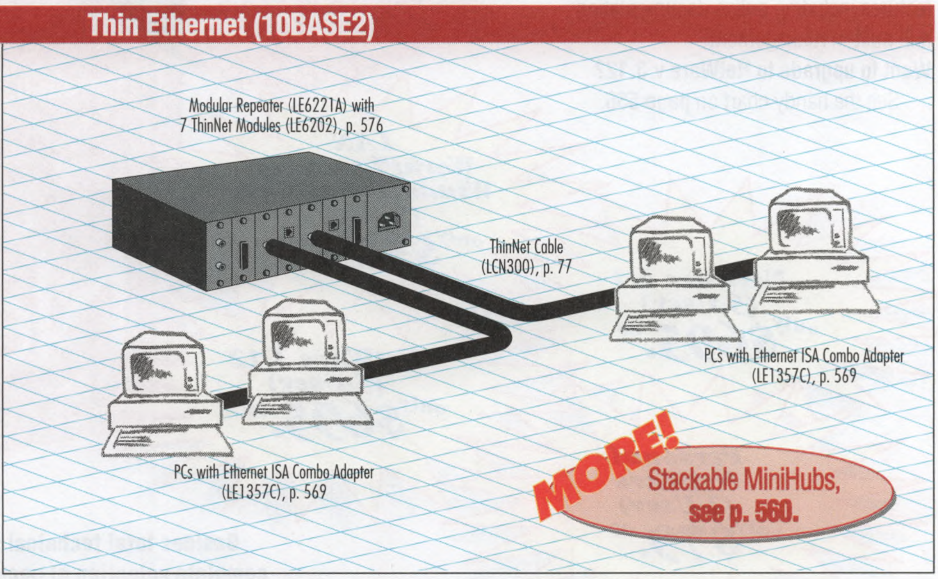
- The maximum length of one segment is 1640 feet (500 m).
- The maximum length of one transceiver cable is 164 feet (50 m).
- The minimum distance between transceivers is 8.2 feet (2.5 m).
- No more than 100 transceiver connections are allowed per segment.
- Both ends of each segment should be terminated with a 50-ohm resistor.
- Only transceivers with SQE test ("heartbeat") disabled should be used with repeaters.


Ethernet Transceiver (LE003A), p. 587
Standard Ethernet Coax Cable (LCN100), p. 78
Ethernet Transceiver (LE003A), p. 587
8-Port Fan-Out (LE780A-R2), p. 588
Transceiver Cable (LCN200), p. 78
Transceiver Cable (LCN200), p. 78
PCs
NetWare® 4.1 File Server with PCI Ethernet Adapter (LE1400C), p. 569

Thin Ethernet (10BASE2)

Thin Ethernet (ThinNet) (10BASE2)

- The maximum length of one segment is 607 feet (185 m).
- The minimum distance between T-connectors is 1.6 feet (0.5 m).
- No more than 30 connections are allowed per segment.
- The first and the last device on each segment should be terminated on one side of their T-connectors with a 50-ohm resistor.
- T-connectors must be plugged directly into the Ethernet device. No cable is allowed between the T and the device.


Modular Repeater (LE6221A) with 7 ThinNet Modules (LE6202), p. 576
ThinNet Cable (LCN300), p. 77
PCs with Ethernet ISA Combo Adapter (LE1357C), p. 569
PCs with Ethernet ISA Combo Adapter (LE1357C), p. 569

MORE! Stackable MiniHubs, see p. 560.

Stackable MiniHub

Total versatility for quick network changes. That's what our Technical Support Team had in mind when they chose their **Product of Choice,** the Stackable MiniHub.

With the Stackable MiniHub (LE2801A) on **page 560**, you never worry about unexpected additions to your network. Adding or moving workstations is quick and easy. And it's sized to fit into the tightest spaces. Priced to fit your budget, too!

BLACK BOX
Stackable MiniHub
TECH SUPPORT'S PRODUCT OF CHOICE

FOR *FAST* TECH SUPPORT,
Call **412-746-5500**

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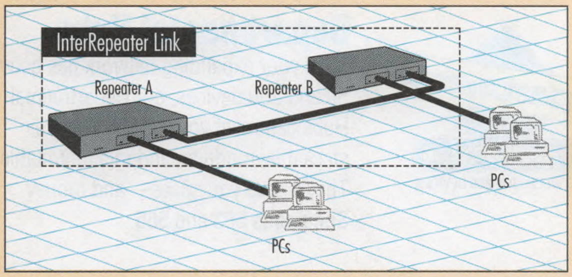
E-mail Us at: info@blackbox.com

Black Box Explains...

Ethernet InterRepeater Links.


InterRepeater Link
Repeater A
Repeater B
PCs
PCs

All Ethernet topologies allow a maximum of two IRL (InterRepeater Links) between two devices. A 10BASE-T Hub counts as a repeater.

In This Section...

Ethernet......................558–589
Introduction to Ethernet....................558–559
10BASE-T Hubs....................560–567
Stackable 10BASE-T Hubs.......560, 563–566
Adapter Cards....................568–571
Ethernet PC Cards (PCMCIA)............569, 571
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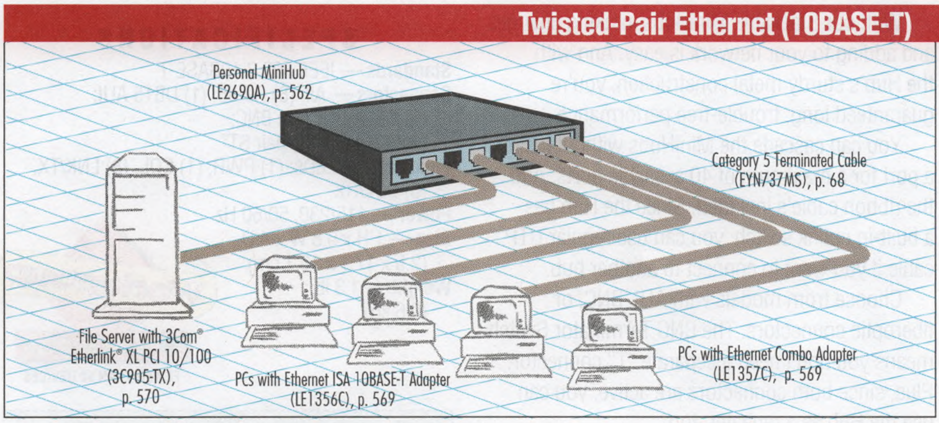
remember to order **cables**
Ethernet Cables, see pp. 77–79.

TO LEARN MORE ABOUT ETHERNET, CALL OUR FAXBACK SYSTEM...

FAXBACK INFORMATION
For an Ethernet Topologies Overview
Request Document Number: 11402
Call 412-746-5500 Anytime

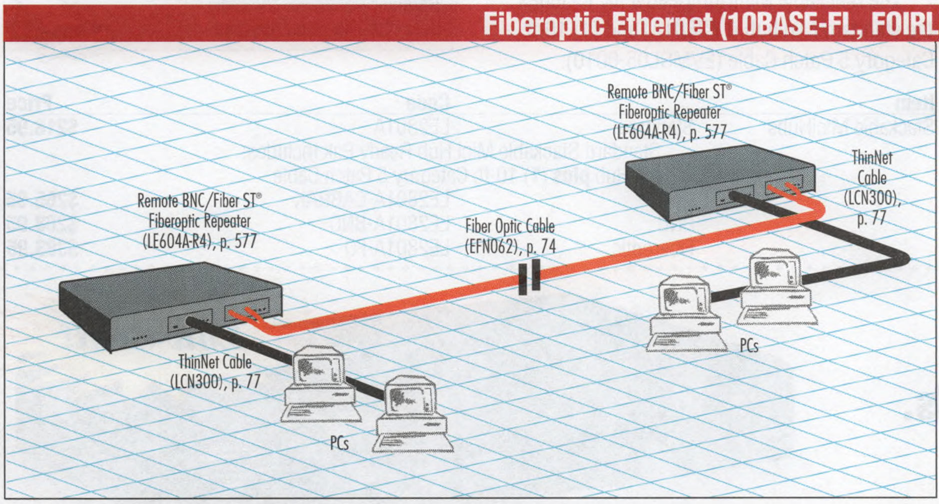
Twisted-Pair Ethernet (10BASE-T)


Personal MiniHub (LE2690A), p. 562
Category 5 Terminated Cable (EYN737MS), p. 68
File Server with 3Com® Etherlink® XL PCI 10/100 (3C905-TX), p. 570
PCs with Ethernet ISA 10BASE-T Adapter (LE1356C), p. 569
PCs with Ethernet Combo Adapter (LE1357C), p. 569

Twisted-Pair Ethernet (10BASE-T)

- The maximum length of one segment is 328 feet (100 m).
- The cable used is 22 to 26 AWG unshielded twisted-pair cable. (For best results use Category 4 or 5 unshielded twisted pair.)
- Devices are connected to a 10BASE-T hub in a star configuration.
- Devices with standard AUI connectors may be attached via a 10BASE-T transceiver.

Fiberoptic Ethernet (10BASE-FL, FOIRL)


Remote BNC/Fiber ST® Fiberoptic Repeater (LE604A-R4), p. 577
ThinNet Cable (LCN300), p. 77
Remote BNC/Fiber ST® Fiberoptic Repeater (LE604A-R4), p. 577
Fiber Optic Cable (EFN062), p. 74
PCs
ThinNet Cable (LCN300), p. 77
PCs

Fiberoptic Ethernet (10BASE-FL, FOIRL)

- The maximum length of one 10BASE-FL (the new standard for fiberoptic connections) segment is 1.2 mi. (2 km).
- The maximum length of one FOIRL (the standard that preceded the new 10BASE-FL) segment is 0.6 mi. (1 km).
- The cable used is 50-, 62.5-, or 100-micron duplex multimode fiberoptic cable (62.5-micron is recommended).
- The connectors used are either ST® or SMA 905.
- Devices with AUI connectors should be attached via a fiber transceiver.

HUBS • HUBS • HUBS • HUBS

Black Box Has Just the Right Hub for You—Look for These

Workgroup
BLACK BOX LAN
FEWER THAN 50 DEVICES

Workgroup Hubs

If your network has fewer than 50 devices, these are the Hubs for you. They're smart-priced and just right for conservative growth. Check out the Workgroup Hubs **below** and on **pages 561–562, 564**, and **566**.

Departmental
BLACK BOX LAN
BETWEEN 50 & 250 DEVICES

Departmental Hubs

If your expanding network has between 50 and 250 devices, our Departmental Hubs can meet your needs. They're stackable, modular, and rackmountable. They'll save you space—and money. **See pages 563** and **565**.

Stackable MiniHubs

A Space Saver with Incredible Versatility!

CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!

Only $199!

VIPreview
Ask for our
10BASE-T VIPreview.

- **Perfect for workgroups that need flexibility for fast moves and easy expansion.**
- **Use all eight ports—and link up to five Stackable MiniHubs without losing a 10BASE-T port.**
- **Build a standalone 10BASE-T network or link to an Ethernet backbone.**
- **Shielded connectors keep "noise" from damaging your data, and small footprint saves space.**

With our Stackable MiniHubs, making changes and adding to your network is easy. And with the Hub's sturdy metal construction, you're guaranteed long, trouble-free performance.

You can cascade the MiniHubs without losing a port for a maximum of 40 available ports. And the ribbon cable's included. Since the Hub has a built-in uplink switch, you can use regular UTP cable if you want to connect to another hub.

Choose from models with AUI, BNC, or fiberoptic connectors. The BNC Terminator Switch means you don't need a separate "T" connector. Plus, since both connectors are active, you can use the Hub as a repeater, too.

The Stackable MiniHub ReadyPak, includes the standard Minihub (LE2801A) and (1) 10-ft. Category 5 Patch Cable (EVMSL05-0010).

SPECIFICATIONS

Standards — IEEE 802.3 10BASE-T
Connectors — All: (8) RJ-45, (1) DB15 AUI;
LE2801A-BNC: (1) BNC;
LE2801A-FO: (1) pair ST®
Indicators — LEDs: (1) PWR, (1) COL, (8) LNK/TX, (8) POL/RX
Power — 115/230, 50/60 Hz
Size — 1"H x 6.8"W x 4"D (2.5 x 17.1 x 10.1 cm)
Weight — 1.3 lb. (0.6 kg)

Workgroup
BLACK BOX LAN
FEWER THAN 50 DEVICES

FAXBACK INFORMATION
Request Document Number: 13071
Call 412-746-5500 Anytime

Item		Code	Price
Stackable MiniHubs	Standard	LE2801A	**$218.95**
	Standard Stackable Mini Hub Ready Pak Includes: the Hub **plus** (**1**) 10-ft. Category 5 Patch Cable	LE2801A-CABPAK	**$265.95**
	BNC	LE2801A-BNC	**$263.95**
	Fiberoptic	LE2801A-FO	**$383.95**

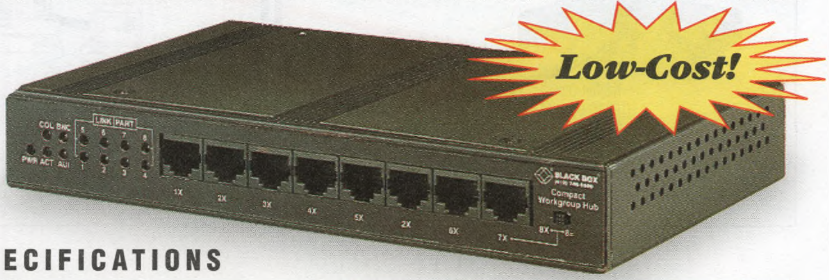
Compact Workgroup Hub

Cost-Effective, Ideal for Workgroups or Larger LANs.

- **Ethernet/IEEE 802.3-compliant.**
- **Switch-selectable AUI/BNC port.**

The small size and low power consumption of this Hub make it the right choice for office environments. The Hub is self-configuring, and no special installation tools are required.

Workgroup
BLACK BOX LAN
FEWER THAN 50 DEVICES



Low-Cost!

SPECIFICATIONS

CE Approval — Yes
Connectors — 10BASE-T: RJ-45; 10BASE2: BNC; 10BASE5: AUI
Indicators — LEDs: Unit, Dual function per TP port
Power — 120/220 VAC, 60/50 Hz, AC 12–16 V 830 mA
Size — 1.2"H x 4.7"W x 7.9"D (3 x 11.9 x 20 cm)
Weight — 1.6 lb. (0.7 kg)

FAXBACK INFORMATION
Request Document Number: 14759
Call 412-746-5500 Anytime

Item	Code	Price
Compact Workgroup Hub	LE679A-R2	**$179.00**

In This Section...
More LAN
Hubs
Adapters/PC Cards
Media Converters
Repeaters

Symbols to Make Your Choice Even Easier.

Enterprise
BLACK BOX LAN
MORE THAN 250 DEVICES

Enterprise Hubs

If you're looking for a Hub that can handle more than 250 devices, check out our full-featured SuperHub1200 on **page 567**. This Hub supports both Ethernet and Token Ring segments to meet all your LAN connectivity needs.

Black Box Corporation
10BASE-T
BLACK BOX LAN Solutions
VIPreview
Free
Call Today! 412-746-5500

PLUS!

For a comprehensive guide to our latest 10BASE-T equipment and networking solutions, consult our 10BASE-T VIPreview. With the convenient pull-out chart, you get up-to-date technical specifications and definitions, application uses, and product descriptions for all of our 10BASE-T hubs. And best of all, it's FREE. Call Black Box today to request your copy.

3Com OfficeConnect

Compact Components to Simplify Small-Office Network Connections.

New

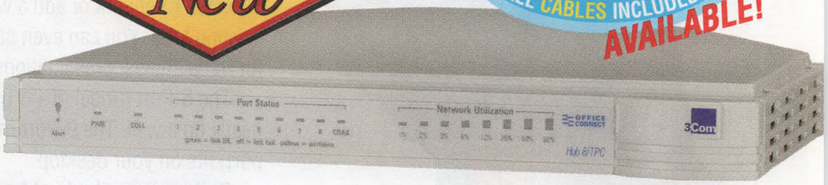
CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!

- **Specially designed for small-scale networks of two to 20 users.**
- **OfficeConnect systems provide a single, centralized focal point for all network management, cabling, and troubleshooting.**
- **Start with the compact desktop footprint and build from there—simply stack the appropriate number of units to create your network.**

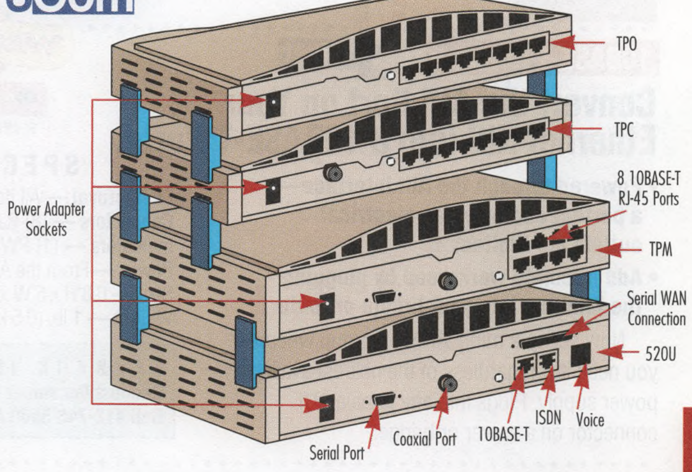
The innovative OfficeConnect® series from 3Com® combines common design features and a small footprint with simple installation procedures that will appeal to both small-business owners and corporate MIS managers alike.

You'll get all the information and resource-sharing power you need with this integrated, cost-effective system. Use it to interconnect multiple computing devices affordably and effectively. And when it's time to add on to your burgeoning LAN, just clip on another unit. The 3Com OfficeConnect system from Black Box is truly that easy to use.

Select the OfficeConnect 8/TPO or 8/TPC Ready Pak and you've got all the cables you need to connect components and users together.



3Com®



3Com OfficeConnect at a Glance:

4-Port Hubs

TP/4 — (4) RJ-45 10BASE-T ports; LEDs indicate packet receipt, collisions, and port status.

TP/4 Combo — Same as the TP/4, *PLUS* (1) BNC and (1) AUI port for backbone flexibility. Also, a crossover switch enables you to cascade another hub off the fourth UTP port.

8-Port Hubs

TPO — (8) 10BASE-T RJ-45 twisted-pair ports; Diagnostic LEDs and Alert LED.

TPC — Same as the TPO Hub, plus: (1) BNC 10BASE2 coaxial port; Network-Utilization LEDs.

TPM — Same as the TPC Hub, plus: (1) DB9 serial port for a management console; Transcend Quick-Configuration Manager management software; Powerful SNMP-based management and full RMON support.

TP100 — Class II Fast Ethernet Repeater; (8) 100BASE-TX ports; Diagnostic LEDs to indicate packet collision and port status; (8) Network Utilization LEDs.

16-Port Hubs

TP16C — Features the same cascadable port as the TP/4 Combo Hub, but this model has (16) UTP ports and (1) BNC port for alternate connection to a coax segment.

CE Approval — All items listed are approved

Item	Code	Price
OfficeConnect Hubs		
4-Port TP/4	3C16704	**$69.00**
TP/4 Combo	3C16703	**$109.00**
8-Port TPO/8	3C16700	**$149.00**
OfficeConnect Hub TPO/8 Ready Pak Includes: the Hub **plus** (**4**) Category 5 Patch Cables	3C16700-CABPAK	**$192.80**
TPC/8	3C16701	**$189.00**
OfficeConnect Hub TPC/8 Ready Pak Includes: the Hub **plus** (**4**) Category 5 Patch Cables	3C16701-CABPAK	**$232.80**
TPM/8	3C16710	**$499.00**
TP100 /8	3C16720	**$1069.00**
16-Port TP/16C	3C16702	**$259.00**
Networking Kit	3C50902B	**$329.00**

Workgroup
BLACK BOX LAN
FEWER THAN 50 DEVICES

FAXBACK INFORMATION
Request Document Number: 18801
Call 412-746-5500 Anytime

remember to order cables

Category 5 Patch Cable, 10-ft. (3.0-m) (Beige)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

Make Quick Changes to Your 10BASE-T LAN *and* Leave Money in Your Budget!

Personal MiniHub — Compact, Portable LAN Expansion for On-the-Spot Networking.

5- or 9-Port

RJ-45 with Switch-Selectable Crossover Uplink!
BLACK BOX®
Personal MiniHub
PWR
RX
LINK
PORT 5
RX
LINK
PORT 1 2 3 4

- **All the features you need in a Hub—and it's the size of a pocket calculator.**
- **Great for temporary setups at trade shows.**
- **Excellent tool for on-site sales demos and training.**
- **Isolate sensitive workgroups at the flip of a switch.**

Expand Your LAN—*Easily!* Just plug the Personal MiniHub's uplink port into a 10BASE-T wall jack to add eight new ports, instantly!

Use it as the central hub of a small standalone 10BASE-T network or add a workgroup to your existing LAN. You can even set up a mobile LAN for trade shows, presentations, or sales demos.

The 5-Port model (4 + 1 uplink port) mounts neatly on a wall. The 9-Port model (8 + 1 uplink port) fits on your desktop.

Both now available at tremendous savings!

SPECIFICATIONS

CE Approval — 230-VAC versions: LE2650AE, LE2690AE
Connectors — LE2650A: (5) RJ-45 female; LE2690A: (9) RJ-45 female
Indicators — LE2650A: (11) LEDs: (5) LINK, (5) RX, (1) PWR; LE2690A: (19) LEDs: (9) LINK, (9) RX, (1) PWR
Power — 115 VAC, 60 Hz, 25 watts (external wallmount power supply)
Size — LE2650A: 0.8"H x 3.3"W x 4.8"D (2 x 8.4 x 12.2 cm); LE2690A: 0.8"H x 5"W x 4.4"D (2 x 12.7 x 11.2 cm)
Weight — LE2650A: 0.8 lb. (0.4 kg); LE2690A: 1 lb. (0.5 kg)

FAXBACK INFORMATION
Request Document Number: 13291
Call 412-746-5500 Anytime

Item	Code	Price
Personal MiniHub		
5-Port (4 + 1)	LE2650A	**$269.95**
9-Port (8 + 1)	LE2690A	**$357.95**
remember to order cables — Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

Workgroup
BLACK BOX LAN
FEWER THAN 50 DEVICES

* * *

10BASE-T MiniHub

8-Port

Convert the AUI Port on Your Ethernet NIC into 8 10BASE-T Ports.

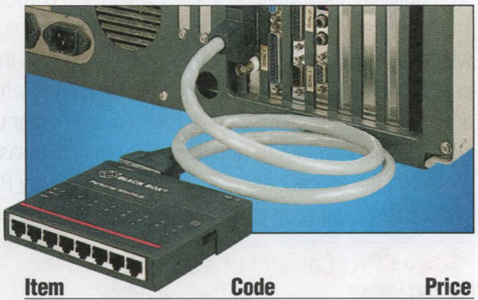
- **Powered through the AUI interface—a perfect choice when electrical outlets are limited.**
- **Add a remote workgroup by plugging the MiniHub into your bridge or router.**

Now set up a mini LAN workgroup wherever you need it—regardless of the nearest available power supply. Plugs into any female AUI connector on a server or bridge.

SPECIFICATIONS

CE Approval — All items listed are approved
Connectors — (8) RJ-45, (1) DB15 AUI male
Indicators — (1) PWR, (9) RX, (9) LINK
Power — From the AUI interface
Size — 0.8"H x 5"W x 4.4"D (2 x 12.7 x 11.2 cm)
Weight — 1 lb. (0.5 kg)

FAXBACK INFORMATION
Request Document Number: 16689
Call 412-746-5500 Anytime



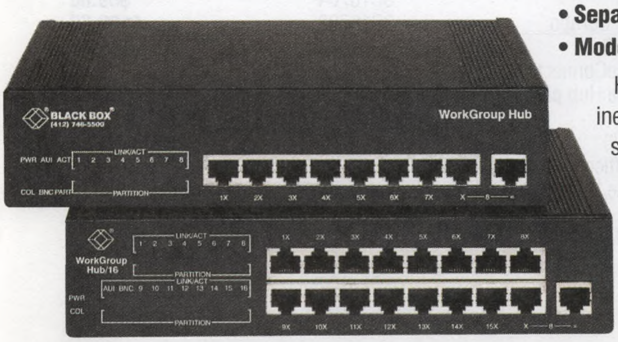
Item	Code	Price
10BASE-T MiniHub	LE2601A	**$395.00**
remember to order cables — Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

* * *

WorkGroup Hubs — Rugged Construction Makes These Some of Our Most Durable Hubs.

8- or 16-Port



- **Sturdy metal enclosure.**
- **Internal autosensing power supply.**
- **Separate uplink port.**
- **Models available with 8 or 16 ports.**

Here's the right choice for basic, inexpensive Hubs. These Hubs have 8 or 16 shielded or unshielded twisted-pair ports, plus a BNC and an AUI port for maximum network connectivity. Each WorkGroup Hub is, of course, fully compliant with IEEE 802.3.

Workgroup
BLACK BOX LAN
FEWER THAN 50 DEVICES

SPECIFICATIONS

CE Approval — All items listed are approved
Connectors — Shielded RJ-45 for 10BASE-T; BNC for 10BASE2; RJ-45 for 10BASE-T
Indicators — Unit: PWR, COLL; Each port: LINK/ACT, PART
Power — 115–230 VAC, 60–50 Hz, autosensing
Size — 1.7"H x 6.7"W x 8.9"D (4.3 x 17 x 22.6 cm)
Weight — 3 lb. (1.4 kg)

FAXBACK INFORMATION
Request Document Number: 16696
Call 412-746-5500 Anytime

Item	Code	Price
WorkGroup Hub/8	LE675A	**$325.00**
WorkGroup Hub/16	LE677A	**$655.00**
remember to order cables — Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

In This Section...
More LAN
Hubs
Adapters/ PC Cards
Media Converters
Repeaters

Workgroup
BLACK BOX LAN
FEWER THAN 50 DEVICES

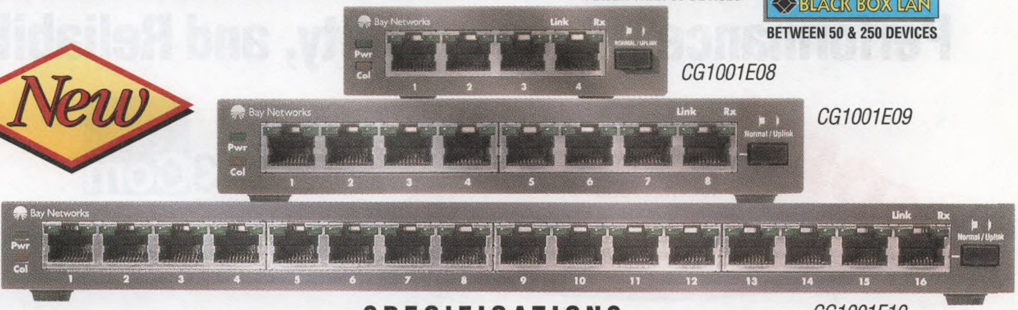
Departmental
BLACK BOX LAN
BETWEEN 50 & 250 DEVICES

BayStack 50 Series 10BASE-T Hubs

Expand Any Small Office Network—without Spending a Fortune.

- **4-, 8-, and 16-Port Hub models available.**
- **Front-panel uplink button enables quick and easy network expansion.**
- **Ideal for simple, inexpensive, plug-and-play desktop connectivity within small-office environments.**
- **Front-panel LEDs provide realtime status information.**
- **AUI and BNC backbone ports for flexible, direct backbone access.**

New



CG1001E08

CG1001E09

CG1001E10

Choose 4, 8, or 16 RJ-45 modular connectors for 10BASE-T connections up to 100 meters over Category 3, 4, or 5 UTP cable.

This group of Hubs supports resource sharing within small offices or cubicles, larger corporate or school environments, or low- to mid-density workgroups. And as your network grows, expansion is easy, too. A front-panel pushbutton uplink port enables you to connect these Hubs to other BayStack 10BASE-T Hubs in one easy step.

Every Hub has built-in BNC ports and the 8- and 16-Port models have AUI ports so you get direct backbone access through thin or thick coax, or any other media type.

Use the front-panel LEDs for up-to-date link status, data received, and collision information.

SPECIFICATIONS

Protocol — 10-Mbps Ethernet

Standards Supported — IEEE 802.3 CSMA/CD, IEEE 802.3i 10BASE-T, IEEE 802.3 10BASE2, IEEE 802.3 10BASE5, ISO 8802-3

CE Approval — All items listed are approved

Power — 115–125 VAC, 60 Hz

Size — CG1001E08: 1.1"H x 3.7"W x 4"D (2.8 x 9.4 x 10.1 cm);
CG1001E09: 1.1"H x 6.2"W x 4"D (2.8 x 15.8 x 10.1 cm);
CG1001E10: 1.1"H x 11.3"W x 4"D (2.8 x 28.6 x 10.1 cm)

Weight — CG1001E08: 0.7 lb. (0.3 kg);
CG1001E09: 1.2 lb. (0.5 kg);
CG1001E10: 2 lb. (0.9 kg)

ABSOLUTELY GUARANTEED FOR LIFE

Bay Networks

FAXBACK INFORMATION
Request Document Number: 18485
Call 412-746-5500 Anytime

Item	Code	Price
BayStack 50 Series 10BASE-T Hubs		
4-Port	CG1001E08	**$125.00**
8-Port	CG1001E09	**$215.00**
16-Port	CG1001E10	**$415.00**
remember to order cables Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

NOTE: Standard discounts may not apply.

MORE! Bay Networks™ Products, **see pp. 483, 485, 493, 519, 554.**

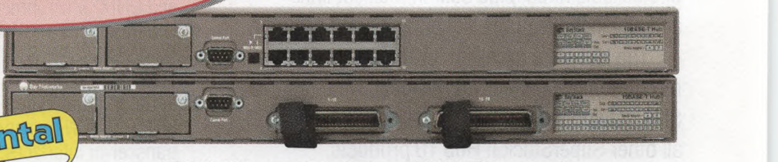
◆ ◆ ◆

BayStack 10BASE-T Stackable Hubs

Build a Solid Foundation for Your Expanding 10-Mbps Network.

- 12- and 24-Port Hub options available.
- Stack up to 10 Hubs to support a total of 260 nodes.
- Delivers industry-standard IEEE 802.3 10BASE-T connectivity to support 10-Mbps Ethernet over UTP cable.
- Front-panel media adapter slots hold cards offering fiber, coax, UTP, and AUI interfaces to support end users or a backbone connection to centralized hubs or routers.
- Add full management capabilities by installing a BayStack Network Management Module in the rear-panel expansion slot.
- Works with all other BayStack products to give you a complete Ethernet workgroup solution.

Departmental
BLACK BOX LAN
BETWEEN 50 & 250 DEVICES



Top: CG1001E01, rear view; Bottom: CG1001E04, rear view.

Bay Networks *from* BLACK BOX

Why? Products in Stock.

Not only do we now carry the complete line of BayStack products—as well as other great Bay Networks products—we can get them to you faster than anyone else. How? Well, if you need it, we have it—in stock and ready to ship. Just give us a call at **412-746-5500**.

SPECIFICATIONS

Standards — IEEE 802.3i, 10BASE-T, 10BASE-F

CE Approval — All items listed are approved

Connectors — CG1001E01: (12) RJ-45, (1) DB9; CG1001E02: (24) RJ-45, (1) DB9

Indicators — LEDs: Data, Collision, Hub, Expansion Slot, Port Link, Partition Status, Power, Initialization

Power — 115–230 VAC, 50–60 Hz, 80 watts

Size — CG1001E01–CG1001E02: 1.8"H x 17.3"W x 11.4"D (4.4 x 43.8 x 29 cm)

Weight — Fully configured: 9.8 lb. (4.5 kg)

FAXBACK INFORMATION
Request Document Number: 17532
Call 412-746-5500 Anytime

Item	Code	Price
BayStack 10BASE-T Stackable Hubs		
12-Port	CG1001E01	**$619.00**
24-Port	CG1001E02	**$1129.00**
24-Port w/ Telco Connector	CG1001E04	**$1399.00**
Media Adapters		
AUI	CG1019001	**$75.00**
BNC	CG1019002	**$145.00**
10BASE-FL Fiber	CG1019003	**$255.00**
10BASE-T MDI	CG1019005	**$95.00**
Single-Mode Fiber	CG1019007	**$745.00**
Network Management Modules		
SNMP	CG1007001	**$509.00**
Advanced Network	CG1007002	**$729.00**
SA Advanced Analyzer	CG1007003	**$1899.00**
Cascade Cable	CG0018001	**$49.00**
Redundant Power Supply	RPSU	**$2589.00**
remember to order cables Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

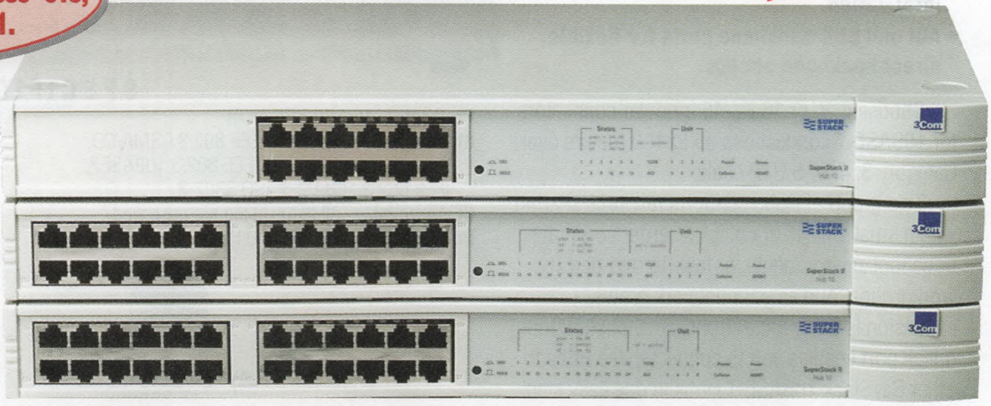
NOTE: Standard discounts may not apply.

3Com SuperStack II Hub 10

Enhanced, Stackable Hubs with Advanced Performance, Manageability, and Reliability Options.

MORE!
3Com® Products,
see pp. 482–483, 492, 494, 496, 509–510, 512, 537–538, 561, 565, 570, 581.

CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!



The economical, reliable, and easy-to-configure SuperStack II Hub 10s support twisted-pair, fiber, and telco and can be stacked together to increase port density. Combine these hubs with other SuperStack II products for a completely integrated networking solution.

- **Create single- or mixed-media Ethernet stacks with twisted-pair, fiber, or Telco hubs.**
- **Slide-in management modules support SNMP with RMON for every hub in the stack.**
- **Built-in security features protect your data and all other interconnected LAN resources.**
- **Optional power supplies (redundant or uninterruptible) ensure continual operation.**

SuperStack™ II Hub 10s provide all the media flexibility, manageability, and economy of stackable hubs, plus built-in resilient links and advanced features like bridging and security.

The Hubs are excellent for departmental and remote-office connectivity via local, wide-area, or SNA networks. Plus, they're fully compatible with all other SuperStack II Hub 10 products.

You can add the SNMP Management Module unit at any time to any Hub in the stack—so you don't need to install another Hub for management capabilities. One Module can manage up to eight Hubs of mixed media types.

The LinkBuilder MicroModule is easy to install in the Transceiver Interface Module slot. And since it's unmanaged, it's the perfect choice for low-cost, simple bridging that doesn't require sophisticated management.

Every component of the SuperStack II series is an integral part of the 3Com® integrated networking system—a complete set of hardware and software products specifically designed for building and managing high-performance networks.

The Ready Pak comes with (12) 10-ft. Category 5 Patch Cables (EVMSL05-0010).

NOTE: Standard discounts may not apply.

SPECIFICATIONS

Management — Transcend applications, featuring SuperStack View, support this product in Windows® and UNIX® environments

Media Interfaces — AUI thick Ethernet, 10BASE-T/RJ-45 UTP/STP, ST® fiber, 50-pin telco, BNC Thin Ethernet

Optional Module Types — Basic and advanced SNMP RMON management, bridge micro-module, transceiver interfaces, redundant power, uninterruptible power, -48 VDC power

Ports Per Unit — 12 or 24 UTP/STP ports, 6 ST fiber ports, or 2 telco ports

Total Number of Units in Stack — Up to eight units operating as one stack that can be managed by one management module

CE Approval — All items listed are approved

FAXBACK INFORMATION
Request Document Number: 17666
Call 412-746-5500 Anytime

Departmental
BLACK BOX LAN
BETWEEN 50 & 250 DEVICES

Item	Code	Price
SuperStack™ II Hub 10		
Twisted Pair		
12-Port	3C16670A	**$519.00**
24-Port	3C16671A	**$899.00**
Ready Pak includes: the Hub **plus** (12) 10-ft. Category 5 Patch Cables	3C16671A-CABPAK	**$1030.40**
Fiber 6-Port	3C16665A	**$1549.00**
Transceiver Interface Modules		
AUI (Female)	3C1206-0	**$69.00**
AUI (Male)	3C1206-4	**$159.00**
Fiberoptic	3C1206-5	**$259.00**
BNC	3C1206-6	**$149.00**
10BASE-T (UTP)	3C12063	**$99.00**
10BASE-FB	3C12067	**$379.00**

Item	Code	Price
SuperStack II Hub 10 Management Modules		
Basic	3C16630A	**$539.00**
RMON	3C16632	**$1539.00**
LinkBuilder Bridge Micro	3C16060	**$549.00**
SuperStack II Hub 10 48-Port Solution TP System	3C16674B	**$2229.00**
SuperStack II Power Systems		
Uninterruptible	3C16010	**$999.00**
Redundant	3C565047A	**$1039.00**
Hub Expansion Cable	3C625	**$49.00**
remember to order cables Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

3Com SuperStack II Port Switch Hubs

MORE! 3Com® Products, **see pp. 482–483, 492, 494, 496, 509–510, 512, 537–538, 561, 564, 570, 581.**

New 3Com Hubs Give You Advanced Port Switching at the Lowest Possible Price.

New

- **Power Grouping™ technology supports multisegment switching and full RMON management.**
- **Fault-tolerance ensures resilient links and redundant management.**
- **Built-in support for Transcend Network Management provides full, network-wide integration with all other 3Com management applications.**
- **Optional Hot-Swap Cascade Unit lets you change any unit on the fly.**

One of the most difficult questions facing network managers is how to satisfy the demand for greater network bandwidth—cost-effectively—without sacrificing manageability and flexibility.

Now Black Box brings you 3Com® SuperStack™ II Port Switch Hubs—the ideal workgroup solution for affordably improving network performance while simplifying network management.

Available with 12 or 24 ports, these Hubs provide four internal, 10-Mbps segments, port switching, full RMON management on each segment, data security, and resilient links. That's everything you need to ensure advanced port switching, all in one chassis, and at the lowest possible price.

Each Hub includes SNMP-based Smart Agent®, part of the intelligent 3Com® Transcend® Network Management System, that reduces management traffic and (ultimately) costs, especially on WAN links. This powerful management feature enables automatic prevention or correction of many problem conditions—*before* they disrupt your entire network.

Built-in redundancy guarantees your management systems remain intact, even if one unit in the stack goes offline.

And with a Hot-Swap Cascade Unit, you can remove a Hub from anywhere in the stack without affecting the remaining units.

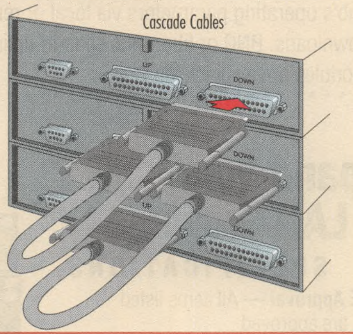
Black Box Explains…

Maximizing Port Density.

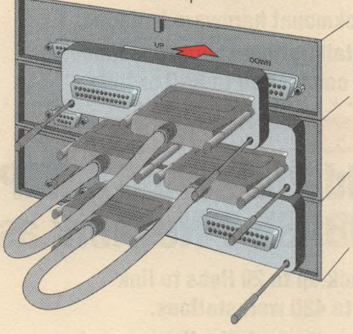
By stacking these Port Switch Hubs together, you can easily and inexpensively increase the number of ports in your network. Use a series of Cascade Cables (**below, left**) to carry the stack's segments and distribute management information. Once these cables are in place, you can add or remove units without turning off the power.

For even more flexibility, use the Hot-Swap Cascade Units that connect with the Cascade Cables (**below, right**). Then, if you need to remove a single hub or replace a unit, the stack will continue to function as a single unit.

Cascade Cables



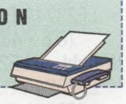
Cascade Cables with Optional Hot-Swap Cascade Units



SPECIFICATIONS

CE Approval — All items listed are approved
Connectors — Both: Two slots for optional Transceiver Interface Modules, one 9W D-Type RS-232 port;
3C16405: (12) RJ-45 ports;
3C16406: (24) RJ-45 ports
Power — 115–230 VAC, 50–60 Hz
Size — 1.7"H x 17.3"W x 6.6"D (4.4 x 44 x 16.8 cm)
Weight — 3C16405: 4.4 lb. (2 kg);
3C16406: 4.6 lb. (2.1 kg)

FAXBACK INFORMATION
Request Document Number: 18526
Call 412-746-5500 Anytime



Item	Code	Price
3Com SuperStack II Port Switch Hubs		
12-Port	3C16405	**$899.00**
24-Port	3C16406	**$1299.00**
Cascade Cables		
1-ft. (0.3-m)	3C16420	**$39.00**
3-ft. (0.9-m)	3C16421	**$49.00**
9-ft. (2.7-m)	3C16422	**$59.00**
Hot-Swap Cascade Unit	3C16430	**$489.00**
Transceiver Interface Modules		
AUI (Female)	3C1206-0	**$69.00**
AUI (Male)	3C1206-4	**$159.00**
Fiberoptic	3C1206-5	**$259.00**
BNC	3C1206-6	**$149.00**
10BASE-T (UTP)	3C12063	**$99.00**
10BASE-FB	3C12067	**$379.00**

remember to order cables

Category 5 Patch Cable (Beige)
10-ft. (3.0-m)
EVMSL05-0010 **$10.95**

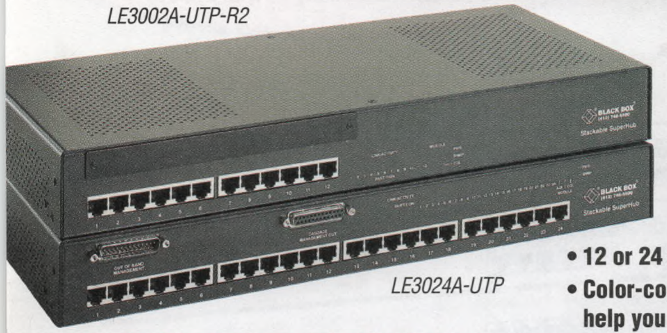
For other lengths, see p. 69.

3Com®

Departmental
BLACK BOX LAN
BETWEEN 50 & 250 DEVICES

Stackable Super Hubs

Start with This Super-Flexible Hub and Protect Your Investment as You Expand Your LAN.



TECH SUPPORT'S PRODUCT OF CHOICE

Perfect for Workgroup Applications...

Workgroup
BLACK BOX LAN
FEWER THAN 50 DEVICES

- **Basic Models require no configuration—perfect for setting up small workgroups.**
- **Uplink ports make LAN expansion simple.**
- **Basic units can be field-upgraded to SNMP.**

Great for Departmental Applications, too!

Departmental
BLACK BOX LAN
BETWEEN 50 & 250 DEVICES

- **One Master Hub can manage a stack with four Client Hubs for up to 120 users.**
- **Use out-of-band management for both Client *and* Master Models.**
- **Master Hubs are fully SNMP-compliant.**
- **Rackmount hardware included.**
- **Install Optional backbone modules for connection to BNC or fiber.**

- **12 or 24 shielded or UTP ports.**
- **Color-coded port- and hub-status indicators help you make informed assessments about system performance.**
- **Includes CONTROL! Network Management Software.**

BLACK BOX® Stackable Super Hubs provide expandability and convenience for a workgroup or a departmental environment while maximizing port density, security, and management capabilities.

You can configure the units in a single or multiple collision domain, but manage them as a single unit with CONTROL! SNMP software—which we've included free (**see page 555**).

CONTROL! offers threshold alarms, traps, polling timer, and autodiscovery topology in your Windows® 95 or Windows NT™ v.4.0 environments. And real-time SNMP statistic reporting provides up-to-date port performance in convenient tabular or graphical format.

Flash EPROM enables you to update the hub's operating parameters via local or remote downloads. BNC or fiberoptic slide-in uplink modules are available as well.

SPECIFICATIONS

Management — Basic models: Unmanaged; Client and Master models: SNMP
Standards — IEEE 802.3, 10BASE5, 10BASE-T, 10BASE2, 10BASE-FL/FOIRL
CE Approval — All items listed are approved
Connectors — All models: (12) or (24) RJ-45, (1) DB15 AUI, (2) RJ-45 uplink ports, (1) BNC or ST® with optional modules; Client and Master models: (2) DB25 for management
Indicators — Power, Management, AUI, Collision, Link/Activity, Partition
Power — 115–230 VAC, 50–60 Hz, autosensing, 40 watts maximum
Size — 2.2"H x 17.4"W x 8.1"D (5.6 x 44.2 x 20.6 cm)
Weight — 5 lb. (2.3 kg)

FAXBACK INFORMATION
Request Document Number: 15190
Call 412-746-5500 Anytime

Item	Code	Price
Stackable Super Hubs		
12-Port		
Basic	LE3002A-UTP-R2	**$640.00**
Client	LE3001A-UTP-R2	**$780.00**
Master	LE3000A-UTP-R2	**$1000.00**
24-Port		
Basic	LE3026A-UTP	**$1060.00**
Client	LE3025A-UTP	**$1240.00**
Master	LE3024A-UTP	**$1500.00**
BNC Module	LE3027C	**$60.00**
Fiber Module	LE3028C	**$280.00**
remember to order cables — Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

Stackable Manageable Hubs

Add Ports, Add SNMP—Expand Your 10BASE-T Network as Your LAN Grows.

- **Stack up to 20 Hubs to link up to 480 workstations.**
- **Once stacked, the Hubs operate as a single logical repeater.**
- **Add the SNMP module when you need management capability.**

If you have a large, expanding 10BASE-T network, you need the Stackable Manageable Hub.

Choose the 12- or the 24-port model to start. Then, when you need more ports, just add another Hub.

This stackable system keeps setup and expansion costs low, takes less space in your wiring closet, and is much easier to manage than multiple separate hubs.

SPECIFICATIONS

CE Approval — All items listed are approved
Connectors — All: (1) 50-pin HD–50-pin HD cable;
LE2812A-R3: (12) RJ-45, (1) AUI, (1) BNC, (2) 50-pin HD connectors;
LE2824A-R3: (24) RJ-45, (1) AUI, (1) BNC, (2) 50-pin HD connectors;
LE2850A-R2: (1) DB25, (1) 50-pin HD connector
Indicators — LE2812A-R3, LE2824A-R3: LEDs: (1) Link Integrity, (1) Partition for each port, (1) Power, (1) Collision, (1) Jabber, (1) Traffic;
LE2850A-R2: (1) NMS, (1) Poll, (1) Bus, (1) Fault, (1) Power
Power — 90 to 265 VAC, 50 to 60 Hz, autoswitching
Size — LE2812A-R3, LE2850A-R2: 1.7"H x 19"W x 8.5"D (4.3 x 48.3 x 21.6 cm);
LE2824A-R3: 2.6"H x 19"W x 8.5"D (6.6 x 48.3 x 21.6 cm)
Weight — LE2812A-R3: 5 lb. (2.3 kg);
LE2824A-R3: 6 lb. (2.7 kg);
LE2850A-R2: 2.8 lb. (1.3 kg)

Up to 480 Users per Stack!

Workgroup
BLACK BOX LAN
FEWER THAN 50 DEVICES

Departmental
BLACK BOX LAN
BETWEEN 50 & 250 DEVICES

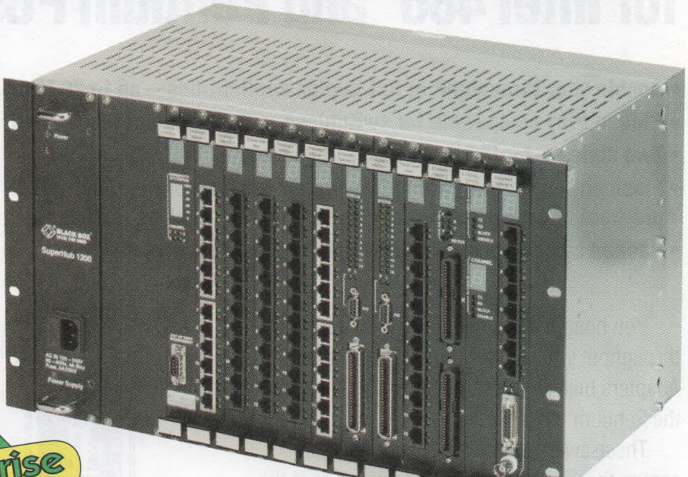
Item	Code	Price
Stackable Manageable Hub		
12-Port	LE2812A-R3	**$850.00**
24-Port	LE2824A-R3	**$1250.00**
SNMP Module	LE2850A-R2	**$595.00**
remember to order cables — Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**

For other lengths and colors, see p. 69.

SuperHub 1200

The Solution for Large Networks. A Single Chassis to Incorporate All Your LAN Connectivity Hardware.

- **Combine four Ethernet and two Token Ring network segments with this versatile modular backbone Hub.**
- **Ideal for medium-to-large networks in business campuses, universities, and large corporations.**
- **Cascade Hubs for more complex networks.**
- **Mix and match up to 11 plug-in modules while using the same system control module for SNMP management.**
- **Quad Channel Ethernet or Dual Channel Token Ring architecture provide increased bandwidth, better security, and simpler balancing of network traffic.**
- **Expandable from 8 to 264 10BASE-T ports, or up to 132 Token Ring ports.**
- **Supports a variety of protocols and interfaces including RJ-45, telco, AUI, BNC, FOIRL, and 10BASE-FL.**
- **Create up to six independent subnets using CONTROL! Network Management Software—included FREE!**
- **Hot-swappable modules.**
- **Offers in-band and out-of-band network management.**



Enterprise
BLACK BOX LAN
MORE THAN 250 DEVICES

If your network requires advanced network management options and scaling capacity, the SuperHub 1200 is for you. Specifically designed for more complex networking environments, the SuperHub 1200 enables you to manage up to four Ethernet and two Token Ring network segments. It's the perfect way to simplify you network.

The SuperHub's modular structure accommodates a mix of interface cards and connectors. It also supports a variety of protocols and interfaces including RJ-45, telco, AUI, BNC, FOIRL, and 10BASE-FL, so it offers you real opportunities for growth. You can even cascade Hubs to build extensive networks.

A unique multichannel architecture—consisting of four Ethernet and two Token Ring backplane channels—provides increased bandwidth, a higher degree of network security, and simpler balancing of network traffic.

High-performance reliability features ensure fault-tolerant networking. A redundant timing source ensures individual modules will continue to function should a master module fail or removal occur.

Advanced ASIC technology works with CONTROL! Network Management Software—which we include free—to monitor every port in realtime and track this information in tabular or graphical form for easy access. Since all events are logged for future reference, you're able to monitor performance as well as diagnose network problems.

SPECIFICATIONS

Backplane — (4) Ethernet Channel Bus, (2) Token Ring Channels, (1) System Control Bus

Network Management — SNMP agent for management from CONTROL! or any other SNMP-based management stations via in-band (Ethernet) or out-of-band (RS-232)

Standards — IEEE 802.3 10BASE2, 10BASE5, 10BASE-T, SNMP, MIB II, IEEE 802.3 Repeater MIB SLIP, TFTP

CE Approval — All items listed are approved

Interface — LE1200A–LE1202C, LE1204C, LE1206C, LE1209C–LE1211C

Connectors — BNC, RJ-45, Telco, AUI®, and ST®

Indicators — LEDs: Power, Link, Activity, Partition, (7) Hub segment Ethernet channels, (7) Module segments SNMP channels

Power — 115–230 VAC autosensing

Size — 10.4"H x 19"W x 11.2"D (26.4 x 48.3 x 28.4 cm)

Weight — 13.2 lb. (6 kg)

FAXBACK INFORMATION
Request Document Number: 16713
Call 412-746-5500 Anytime

Item	Code	Price
SuperHub 1200 Chassis	LE1200A	**$2695.00**
SuperHub 1200 Chassis with Redundant Power Supply	LE1200A-PS	**$3295.00**
Super Hub Modules		
System Control, RS-232	LE1209C	**$500.00**
Fan	LE1210C	**$900.00**
Redundant Power Supply	LE1211C	**$800.00**
Ethernet Hubs		
9-Port (8) RJ-45, (1) BNC/AUI	LE1201C	**$800.00**
12-Port (12) RJ-45	LE1202C	**$860.00**
24-Port (2) Telco	LE1204C	**$1500.00**
Ethernet Local Bridge	LB1205C	**$1295.00**
4-Port Ethernet FOIRL (4) F/O ST Repeater	LE1206C	**$2200.00**
Token Ring MAUs		
8-Port (8) RJ-45 Lobe, RI, RO	LT1207C	**$1380.00**
12-Port (12) RJ-45 Lobe	LT1208C	**$980.00**

You may also need:

Item	Code	Price
CONTROL! Network Management Software	LS3000A	**$599.00**

For more details, see page 555.

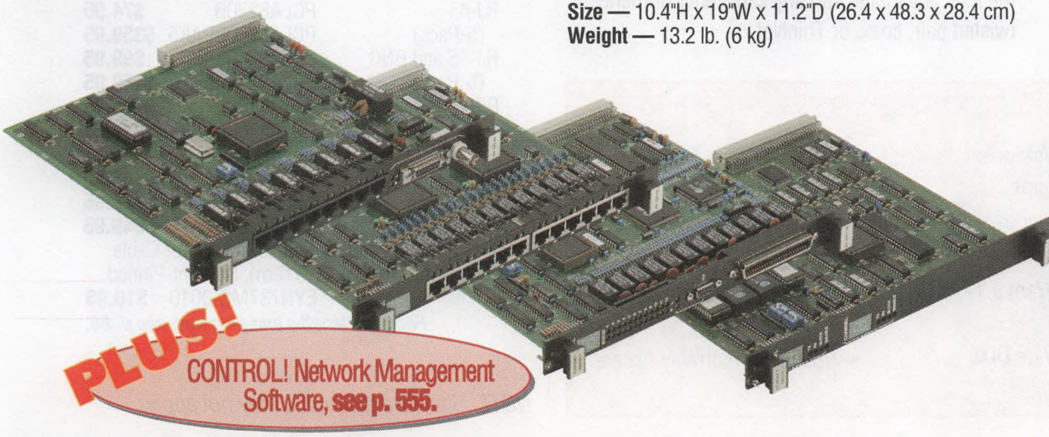
remember to order cables

Item	Code	Price
Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

Item	Code	Price
Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific lengths or bulk cable, see pp. 74 and 118.



PLUS! CONTROL! Network Management Software, **see p. 555.**

Print Servers
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Full-Duplex
Transceivers/ Fan-Outs
Single-Pair Networking
More LAN

Intel EtherExpress PRO/10+ LAN Adapters (PCI and ISA)

The Most Powerful 10-Mbps LAN Cards for Intel 486™ and Pentium PCs.

- **Double your throughput in full-duplex applications—up to 20 Mbps!**
- **Plug 'n Play compatible for switchless, autosensing configuration.**
- **Two styles—for ISA or 32-bit PCI bus slots.**
- **Flash option for ISA cards offers enhanced capabilities: patented pre-boot virus protection, centralized driver updating, and more!**
- **Backed by our world-famous Black Box Tech Support.**

Intel EtherExpress PRO/10+ PCI LAN Adapter
The powerful LAN connection for Intel486 and Pentium processor-based PCs.
High-performance 32-bit busmaster design
32-bit PCI bus interface
Switchless installation and automatic configuration
Full and half-duplex support
intel.
ABSOLUTELY GUARANTEED FOR LIFE

MVP 1995 WINNER PC Computing

NETWORK COMPUTING EDITOR'S CHOICE

You bought a top-notch PC. Now get all the throughput you paid for by installing the only LAN Adapters built by the same folks who brought you the Pentium® chip—Intel®.

These award-winning Network Adapters ensure the smoothest data transmissions at the highest possible data rates. Developed by the experts who wrote the book on high-performance data processing, these new Plug 'n Play Ethernet cards take the tedium and dread out of setting jumpers and toggling DIP switches. All you do is plug them in to maximize bus-level data transfer rates in your client workstations or LAN servers.

You'll appreciate hands-off functions like auto hardware configuration, auto driver installation for NetWare® clients, and autosensing media selection (just plug the LAN cable into the appropriate connector to activate a port).

Each Adapter can dynamically negotiate to support twice the speed of standard 10-Mbps Ethernet when linked to a full-duplex switching hub—a great solution for enhancing throughput without completely upgrading to Fast Ethernet.

The **PCI Adapters'** 32-bit busmastering architecture strikes the perfect balance of maximum processing with minimal CPU usage.

The **ISA Adapters** give you concurrent processing, a 32-bit instruction set, a 32-KByte buffer, and software-selectable interrupt levels to capitalize on the capabilities of today's fastest PCs.

The **ISA with Flash Version** includes patented pre-boot virus protection, an on-board configuration log that records the last five hardware inventory and software configuration changes (for simplified troubleshooting), and the capacity to download IPX™ or ODI™ drivers and network utilities from a NetWare® file server—to any node on your LAN!

Manage these Adapters with Intel LANDesk® Express remote node management software for NetWare (available free on the Intel Bulletin Board Service), or via SNMP by running Intel LANDesk SNMP Gateway software.

Every Adapter features LAN and Link LEDs so you can monitor activity at a glance. And with a variety of connector options, you can plug the Intel advantage into any cable environment: twisted pair, coax, or ThinNet.

intel®

CE Approval — All items listed are approved

Call Black Box TODAY and *shift into high gear* with intel. LAN Adapters!

MORE! Intel® Products, see pp. 495–496, 498, 536, 549–552, 580, 599–600.

FAXBACK INFORMATION
Request Document Number: 17570
Call 412-746-5500 Anytime

Item	Code	Price
Intel EtherExpress™ PRO/10+ LAN Adapters		
PCI		
RJ-45	PILA8520	**$79.95**
(5-Pack)	PILA8520PAK5	**$379.95**
RJ-45, AUI, and BNC	PILA8500	**$119.95**
(5-Pack)	PILA8500PAK5	**$539.95**
ISA		
RJ-45	PCLA8220B	**$74.95**
(5-Pack)	PCLA8220BPAK5	**$359.95**
RJ-45 and BNC	PCLA8210B	**$99.95**
(5-Pack)	PCLA8210BPAK5	**$459.95**
RJ-45, AUI, and BNC	PCLA8200B	**$109.95**
(5-Pack)	PCLA8200BPAK5	**$499.95**
ISA with Flash		
RJ-45	PCLA8215B	**$109.95**
RJ-45, AUI, and BNC	PCLA8205B	**$129.95**
(5-Pack)	PCLA8205BPAK5	**$549.95**
remember to order cables Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

NOTE: Standard discounts may not apply.

Drivers Supported—

- Artisoft® LANtastic®
- Banyan® VINES™ Client
- DEC™ PATHWORKS®
- FTP PC/TCP®
- IBM® LAN Server™
- Microsoft® LAN Manager
- Microsoft MS-DOS® and OS/2®
- Microsoft Windows for Workgroups
- Microsoft Windows® 95
- Microsoft Windows NT™ 3.5
- Novell® NetWare 3.11, 3.12, 4.02 Server
- Novell NetWare DOS ODI Client
- Novell NetWare OS/2 ODI Requestor
- Packet Driver
- SCO® UNIX®
- SunSoft® Solaris®
- Unixware®
- Wollongong PathWay Access

Ethernet ISA Adapter Cards

- **Full NE2000 compatibility.**
- **ISA or EISA bus interface.**
- **Full-duplex with UTP cable.**
- **Automatic media detection.**
- **Socket for BOOT PROM.**

Painless Plug-and-Play Ethernet Card Installation.

Just plug in BLACK BOX® Ethernet ISA Adapters and they take care of the details. And these Adapters combine the NE2000™ industry-standard functionality with Windows® 95 plug-and-play support.

LE1356C
LE1357C

SPECIFICATIONS

Drivers — All: NE2000, run standard drivers with Windows for Workgroups™, Windows 95, Windows NT™, NetWare®, and UNIX®; LP0010A–LP0012A, LP0015A–LP0017A: OS/2®, SCO®, and more

CE Approval — All items listed are approved

Connectors — LE1356C, LP0010A–LP0012A: RJ-45; LE1357C: RJ-45, DB25, and BNC; LP0015A–LP0017A: (1) RJ-45, (1) DB15, (1) BNC

Interface — All: ISA and Plug-and-Play 1.0; Hardware parameters configurable by standard Plug-and-Play drivers or Windows 95

FAXBACK INFORMATION
Request Document Number: 14704
Call 412-746-5500 Anytime

Item	Code	Price
Ethernet ISA Adapter Cards		
10BASE-T (Twisted Pair)		
Single	LE1356C	**$49.95**
5-Pack	LP0010A	**$239.95**
10-Pack	LP0011A	**$459.95**
25-Pack	LP0012A	**$1049.95**
Combo (Twisted Pair, AUI, or Coax)		
Single	LE1357C	**$69.95**
5-Pack	LP0015A	**$329.95**
10-Pack	LP0016A	**$629.95**
25-Pack	LP0017A	**$1499.95**
remember to order cables: Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

◆ ◆ ◆

PCI Ethernet Adapter Cards

Pentium Users: Access Your Ethernet 200 Kbps Faster.

- Standard Ethernet, ThinNet, and 10BASE-T connections are all built-in on the LE1400C.
- Two or four 10BASE-T connectors on the LE1420C and LE1440C.
- Use PCI technology in your Pentium® PC—without an expensive switching hub.
- Run full-duplex and switched Ethernet.
- Full driver set included.

FAXBACK INFORMATION
For LE1400C and LE1440C: 15183,
For LE1420C: 16098,
Call 412-746-5500 Anytime

SPECIFICATIONS

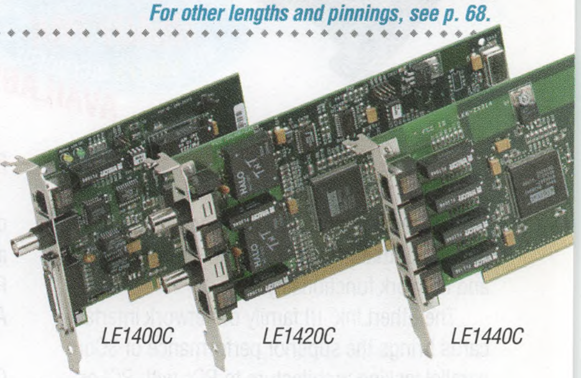
Bus — PCI Rev 2

Drivers — LE1400C, LE1420C, LE1440C: NetWare: 4.x, 3.12, 3.11, DOS, OS/2, NetWare Lite™ and Personal NetWare LAN; LAN Workplace; DOS ODI™; Microsoft®: Windows NT 3.x, Windows for Workgroups 2.x, LAN Manager 2.0-3.0 DOS and OS/2; IBM: LAN Server 3.x and 2.x; UNIX: SCO UNIX System Vr3, AT&T® UNIX System Vr4, Univel UnixWare® System Vr4, SunSoft ISC® UNIX System Vr3, SunSoft Solaris® 2.0; NeXT®: NeXTSTEP™ 2.0; LE1400C: Artisoft® NDIS 2.x

Connectors — LE1400C: (1) AUI, (1) BNC, (1) RJ-45; LE1420C: (2) RJ-45, (2) BNC; LE1440C: (4) RJ-45

Size — LE1400C, LE1420C: Half-card; LE1440C: Full-card

Weight — LE1400C: 0.6 lb. (0.3 kg); LE1420C: 0.7 lb. (0.3 kg); LE1440C: 0.9 lb. (0.4 kg)



Item	Code	Price
PCI Ethernet Adapter Cards		
32-Bit Combo	LE1400C	**$139.00**
2-Port (10 Mbps)	LE1420C	**$429.00**
Multiport	LE1440C	**$699.00**
remember to order cables: Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

◆ ◆ ◆

Modular Parallel Adapters

Be Prepared! Make On-the-Spot LAN Connections—*Anywhere!*

EXCLUSIVE

- **Self-Powering Cable (SPC) support: No heavy and bulky power supply required.**
- **Enhanced Parallel Port (EPP).**
- **Easy to install and use. No jumpers or switches.**
- **Available for ARCNET®, too.**

Connect notebooks, laptops, or desktop PCs to virtually any Ethernet LAN, regardless of the cabling system, topology, or network operating system. It's fast and easy.

The Modular Media Units are the key to the Adapters' versatility. With three Ethernet models available—10BASE-T, BNC, and AUI—you can attach the Parallel Adapter to *any* cabling system.

The Modular Parallel Adapters also feature full parallel port compatibility for Enhanced Parallel Port (EPP), plus unidirectional and bidirectional support.

SPECIFICATIONS

Both Parallel Adapter Types

Drivers of NOS Support — NDIS 2.0.1, NDIS 3, ODI, Packet, Windows NT 3.1, 3.5 x, Windows 95, OS/2

CE Approval — LE075A-R2

Size — 4"H x 2.4"W x 1.0"D (10.3 x 6.1 x 2.5 cm)

Weight — 0.2 lb. (<0.1 kg)

Ethernet Parallel Adapters

Speed — 10 Mbps

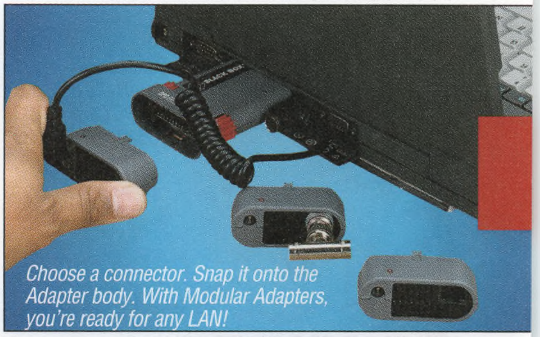
Standards — IEEE 802.3 Ethernet compatible with 10BASE-T, 10BASE2, and 10BASE5

ARCNET Parallel Adapters

Connectors — BNC, RJ-11

Drivers — ODI

FAXBACK INFORMATION
Request Document Number: 15216
Call 412-746-5500 Anytime



Choose a connector. Snap it onto the Adapter body. With Modular Adapters, you're ready for any LAN!

Item	Code	Price
Modular Parallel Adapters for Ethernet		
10BT	LE073A-R2	**$189.00**
BNC	LE074A-R2	**$209.00**
AUI	LE075A-R2	**$209.00**
Modular Media Units for Ethernet		
EN-10BT	LE171	**$80.00**
EN-BNC	LE172	**$80.00**
EN-AUI	LE175	**$80.00**
Modular Parallel Adapter for ARCNET	LA099A	**189.00**
Modular Parallel Mux	LE170	**$89.00**
remember to order cables: Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

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3Com Network Interface Cards

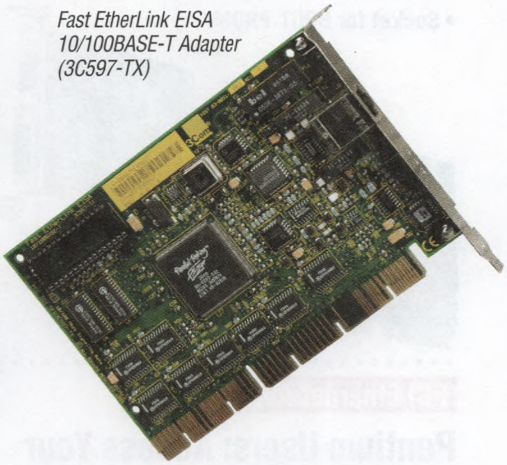
3Com NICs—Great Prices, in Stock, All from Black Box.

EtherLink III PCI/TPO Adapter (3C590-TPO)

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!

EtherLink XL PCI Combo Adapter (3C900-COMBO)

Fast EtherLink EISA 10/100BASE-T Adapter (3C597-TX)



EtherLink III Parallel Tasking Network Interface Cards

The most popular 3Com® Ethernet Cards provide unmatched performance, reliability, and network functionality.

The EtherLink® III family of network interface cards brings the superior performance of 3Com parallel tasking architecture to PCs with PCI or ISA buses. You can also choose from Cards with twisted-pair or coaxial Ethernet connections, or special combo cards that feature both connector types for use in either network cable environment. Also available in affordable five-packs.

The Ready Pack comes with one 10-ft. Category 5 Patch Cable (EVMSL05-0010).

EtherLink III LAN+28.8 Modem PC Card (3C562D-TP)

EtherLink III PC Cards (PCMCIA)

The industry's fastest PC Cards feature Parallel Tasking LAN performance and an award-winning PC Card modem.

EtherLink III PC Cards give you a choice of high-performance Ethernet LAN or LAN+28.8 modem connections. Both Cards provide notebook computer users with the fastest direct and dialup network access available, plus easy installation and guaranteed compatibility with your network.

CE Approval — All items listed are approved

Fast EtherLink XL Adapters

The XL family of network adapters provides optimized network performance for both Ethernet and Fast Ethernet networks with patented 3Com Parallel Tasking® architecture, PACE™ Interactive Access technology, and DynamicAccess™ features.

The Ready Pack comes with one 10-ft. Category 5 Patch Cable (EVMSL05-0010).

MORE! 3Com® Products, **see pp. 482–483, 492, 494, 496, 509–510, 512, 537–538, 561, 564–565, 581.**

Item	Single Code	Price	Five-Pack Code	Price
EtherLink III Adapters				
16-Bit ISA (BNC/AUI)			3C509B-TPO-5	**$451.22**
(UTP/AUI)	3C509B-TP	**$99.95**	3C509B-TP-5PK	**$469.95**
16-Bit UTP	3C509B-TPO	**$97.95**	3C509B-TPO-5PK	**$419.95**
Ready Pak includes: the Card **plus** (**1**) 10-ft. Category 5 Patch Cable				
	3C509B-TPO-CABPAK	**$108.90**		
16-Bit Combo	3C509B-COMBO	**$129.95**	3C509B-COMBO-5PK	**$529.95**
PCI/TPO	3C900-TPO	**$119.95**	3C900-TPO-5PK	**$539.95**
PCI Combo	3C900-COMBO	**$139.95**	3C900-COMBO-5PK	**$619.95**
Fast EtherLink XL and EtherLink XL Adapters				
XL PCI 10/100 (10/100 Mbps)	3C905-TX	**$139.95**	3C905-TX-5PK	**$639.95**
ReadyPak includes: the Card **plus** (**1**) 10-ft. Category 5 Patch Cable				
	3C905-TX-CABPAK	**$150.90**		
XL PCI UTP (10 Mbps)	3C900-TPO	**$119.95**	3C900-TPO-5PK	**$539.95**
XL PCI Combo (10 Mbps)	3C900-COMBO	**$139.95**	3C900-COMBO-5PK	**$619.95**
Fast EtherLink 10/100BASE-T Adapters				
PCI 10/100 T4	3C905-T4	**$179.95**		
EISA 10/100	3C597-TX	**$249.95**	3C597-TX-5PK	**$1219.95**
EtherLink III PC Cards				
LAN PC Card	3C589D-TP	**$139.95**	3C589D-COMBO	**$189.95**
LAN+28.8 Modem	3C562D-TP	**$429.95**	3C562B-COMBO	**$469.95**
Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**		

remember to order cables

For other lengths and pinnings, see p. 68.

NOTE: Standard discounts may not apply!

Fast EtherLink 10/100BASE-T Adapters

Supports high-performance, reliable networking at 10 or 100 Mbps for PCI- or EISA-bus machines. 3Com 10/100 NICs set the industry standard for performance. With their exclusive Parallel Tasking technology, you get top speeds at both 10 and 100 Mbps. Fast EtherLink Cards support 10/100BASE-TX for EISA and ISA buses, and 10/100BASE-T4 (Category 3, 4, and 5 UTP) for your PCI bus computers.

FAXBACK INFORMATION
Request Document Number: 17697
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Black Box Ethernet PC Cards—the Best in Price *and* Performance.

Ethernet PC

Over 35% Faster
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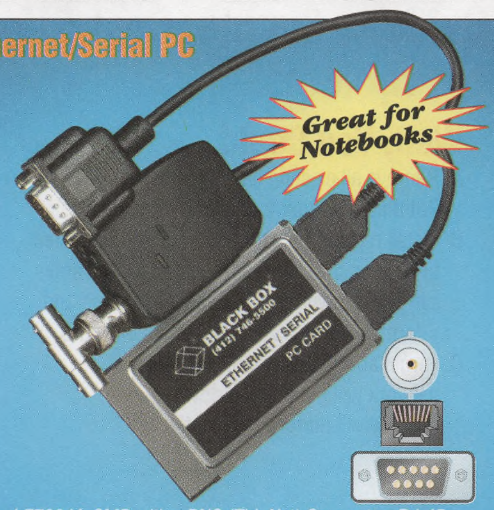
ETHERNET
PC CARD

LE7003A-CMB showing both the BNC (ThinNet) Connector and the RJ-45 (10BASE-T) Connector.

Ethernet/Serial PC



LE7004A-CMB with a BNC (ThinNet) Connector, RJ-45 (10BASE-T) Connector, and a DB9 high-speed serial port.

Ethernet/Modem 28.8 PC

Data/Fax Modem
BLACK BOX
(412) 746-5500
ETHERNET / MODEM 28.8
PC CARD

LE7005A-CMB showing a BNC (ThinNet) Connector, RJ-45 (10BASE-T) Connector, and an RJ-11 Connector.

Ethernet PC Cards

EXCLUSIVE

Ethernet PC Card

- **Innovative software drivers to maximize throughput.**
- **Supports all major network operating systems.**

The quickest way to make a *fast connection* from your PC to an Ethernet LAN. Just plug in this compact network Card for a high-throughput link. Menu-driven installation software simplifies start-up.

Ethernet/Serial PC Card

- **Connect your notebook or portable computer to Ethernet and to a serial device through a single PCMCIA slot.**
- **Both cards feature a standard DB9 serial connector.**

This Card integrates a high-speed Ethernet adapter with a high-speed serial port for simultaneous accessibility from your PC. A buffered 16550 UART supports fast operations for Windows® and OS/2® applications. On the LAN side, this Card supports all major networking operations.

Ethernet/Modem 28.8 PC Card

- **Simultaneous Data/Fax Modem and Ethernet LAN operation.**
- **Both cards feature an RJ-11 modem port.**
- **28.8- or 14.4-Kbps send-and-receive Data/Fax modem.**
- **Supports ITU V.34, V.FC, V.32 bis, V.32, V.22 bis, V.22 A/B, V.23, V.21, and Bell 212A and 103 data transmission.**

This two-in-one Card offers unique multifunction opportunities: Plug into a LAN *and* dial out to a remote modem at 28.8 Kbps—the *fastest* dialup data rate. Error-correction and compression boost throughput even higher. Send faxes, too! A terrific way to maximize your investment.

SPECIFICATIONS

Ethernet Standard — IEEE 802.3

Interface Standards — PCMCIA 2.1, Type II

PCMCIA Software Support — Cards and Socket Services Direct Enablers

CE Approval — LE7005A-UTP, -CMB

Connectors — LE7003A-UTP: RJ-45;
LE7003A-CMB: RJ-45, BNC;
LE7004A-UTP: RJ-45, DB9;
LE7004A-CMB: RJ-45, BNC, DB9;
LE7005A-UTP: RJ-45, RJ-11;
LE7005A-CMB: RJ-45, BNC, RJ-11

Power — LE7003A-UTP: 60 mA (Active);
LE7003A-CMB: 260 mA (Active);
LE7004A-UTP: 110 mA (Active), 95 mA (Sleep);
LE7004A-CMB: 310 mA (Active), 290 mA (Sleep);
LE7005A-UTP: 170 mA (Active), 90 mA (Sleep);
LE7005A-CMB: 380 mA (Active), 300 mA (Sleep)

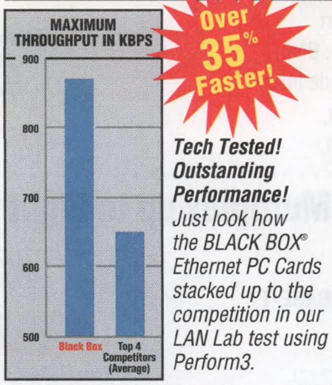
Size — 0.2"H x 2.1"W x 3.4"D (0.5 x 5.4 x 8.5 cm)

Weight — <0.1 lb (< 0.1 kg)

BUYER'S GUIDE

ETHERNET PC CARD COMPATIBILITY WITH NOSs

Network Operating Systems	Ethernet PC Card (LE7003A)	Ethernet/ Serial PC Card (LE7004A)	Ethernet/ Modem 28.8 PC Card (LE7005A)
Banyan® VINES™	✓	✓	✓
Chameleon® NEWT	✓	✓	✓
DEC™ PATHWORKS®	✓	✓	✓
FTP Lanwatch	✓		
FTP PC/TCP®	✓	✓	✓
IBM® LAN Server V	✓	✓	✓
IBM OS/2 LAN Server	✓	✓	✓
IBM PC LAN	✓	✓	✓
LANtastic® X	✓	✓	✓
Microsoft® LAN Manager	✓	✓	✓
Novell® DOS 7	✓	✓	✓
Novell NetWare® 2.x, 3.x, 4.x	✓	✓	✓
Novell NetWare Lite™	✓	✓	✓
OS/2 Warp	✓		
PC-NFS®	✓	✓	✓
Windows 95	✓	✓	✓
Windows for Workgroups	✓	✓	✓
Windows NT™ Server	✓	✓	✓
Windows NT 3.1, 3.5x	✓	✓	✓
Wollongong Pathway	✓	✓	✓
Wollongong WIN/TCP	✓	✓	✓



Tech Tested! Outstanding Performance! *Just look how the BLACK BOX® Ethernet PC Cards stacked up to the competition in our LAN Lab test using Perform3.*

FAXBACK INFO
For Ethernet PC: 16287,
For Ethernet/Serial PC: 16342,
For Ethernet/Modem 28.8 PC: 16311,
Call 412-746-5500
Anytime

Item	Code	Price
Ethernet PC Card		
UTP	LE7003A-UTP	**$169.00**
Combo (UTP & BNC)	LE7003A-CMB	**$189.00**
Ethernet/Serial PC Card		
UTP	LE7004A-UTP	**$369.00**
Combo (UTP & BNC)	LE7004A-CMB	**$399.00**
Ethernet/Modem 28.8 PC Card		
UTP	LE7005A-UTP	**$549.00**
Combo (UTP & BNC)	LE7005A-CMB	**$579.00**
remember to order cables — Category 5 Solid Cable 10-ft. (3.0-m)	EYN737MS-0010	**$10.95**
ThinNet Cable, 20-ft. (6.1-m) PVC	LCN300-0020	**$20.95**

For other lengths, see p. 68.

For other lengths and plenum applications, see p. 77.

Token Ring PC Cards! See page 601.
Fast Ethernet PC Cards! See page 497.

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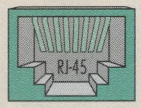
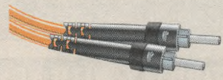
Transceivers/ Fan-Outs
Single-Pair Networking
More LAN

Here's Your Black Box Guide to Simple, Cost-Effective Solutions to Common Connectivity Problems!

Fact: UTP Cable is *the* choice for new network installations because it's easy to use and inexpensive, and it supports high-speed networks. So major switch manufacturers produce high-speed Ethernet devices with RJ-45 connectors.



The Problem: You want to take advantage of the latest in Ethernet switch technology but your network has fiber or coax cable—not UTP—already installed. What are your options?



Preinstalled cable OTHER THAN UTP?

Well, You Could...

A. Remove all existing cabling and install UTP. But that's expensive and time-consuming.

B. Install repeaters so any port can be connected to fiber or coax. But repeaters are costly and can slow down the link since they retime and reformat every packet that comes through.

C. Forget about the switch. But your network will get bogged down—and it won't perform efficiently.

...or for the Perfect Solution...

Order a BLACK BOX® Twister Media Converter! The Twister offers one-step installation—without recabling or additional repeaters—so you save money!

Compare & Save!

The "old" way (B.):

10BASE-T to Fiber Repeater $680.00

AND...There's a limit to the number of repeaters you can have on your network...

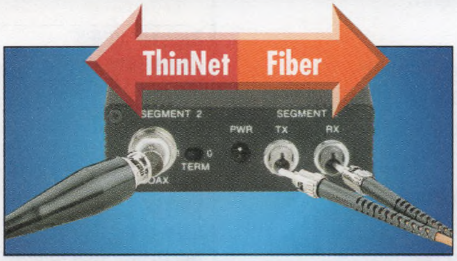
The Black Box way: 10BASE-T to Fiber Twister Media Converter $325.00

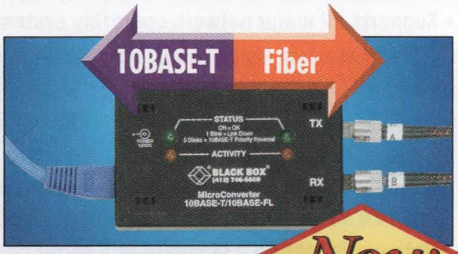
No Worries! No Limitations!

Save over $350!

Twister Media Converters Need to Mix Ethernet Cable Types? No Problem...Connect 10BASE-T

- **Translates all signals, including collision data, from one cable medium to the other.**
- **Installation's easy. Just plug in the cables.**
- **Switch between different wiring systems without adding to your repeater count.**





New

Media Converters

Connect any LAN cable medium to your 10BASE-T network with a simple plug-in installation. Whether you need to connect an entire segment to 10BASE-T or just one workstation, our Media Converters are the quick solution.

Eight converter combinations provide you with all the options you need to translate between different wiring systems. You can go from 10BASE-T to single- and multimode fiber, BNC, and AUI, as well as from BNC to multimode fiber.

Both Ready Paks come with one 10-ft. Category 5 Patch Cable (EVMSL05-0010).

Media Converter Extender (10BASE-T to 10BASE-T)

You know that PC—the one at the other end of the building. The one that's just a little too far away to connect to your 10BASE-T network. Now you can connect a workstation that's beyond the 10BASE-T 328-foot (100-m) distance limit for a total of 656 feet (200m). You can also join two wiring concentrators that are more than 328 feet apart.

Double the Distance!

MicroConverter

Use the MicroConverter to convert a twisted-pair interface to fiber without adding to your repeater count. It's a cost-effective way to either extend a 10BASE-T network or to link it to a larger network via a fiber cable.

This Converter supports maximum distance for 10BASE-T (100 m) and 10BASE-FL (2 km), as well as shielded and unshielded twisted-pair cabling and stranded and full-duplex Etherent. Plus you also get 100% link fault detection on 10BASE-T and 10BASE-FL segments.

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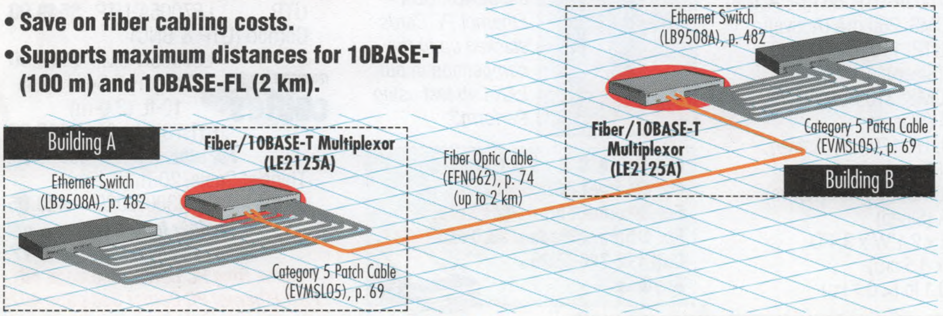
Fiber/10BASE-T Multiplexor Multiplex up to Eight 10BASE-T Links over a Single Fiber Link.

- **Save on fiber cabling costs.**
- **Supports maximum distances for 10BASE-T (100 m) and 10BASE-FL (2 km).**

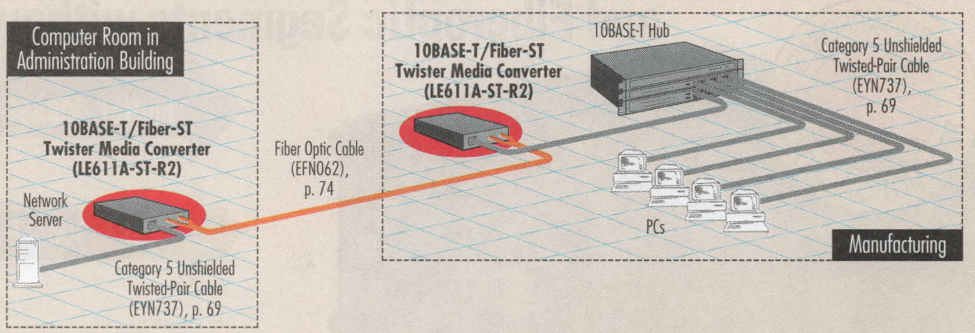

Building A
Fiber/10BASE-T Multiplexor (LE2125A)
Ethernet Switch (LB9508A), p. 482
Category 5 Patch Cable (EVMSL05), p. 69
Fiber Optic Cable (EFN062), p. 74 (up to 2 km)
Ethernet Switch (LB9508A), p. 482
Fiber/10BASE-T Multiplexor (LE2125A)
Category 5 Patch Cable (EVMSL05), p. 69
Building B

With the Fiber/10BASE-T Multiplexor, you can run up to eight 10BASE-T links up to 2 kilometers over a single pair of ordinary multimode fibers.

Ethernet multiplexing is the economical new solution to the problem of extending Ethernet segments. Several Ethernet 10BASE-T links are time-division multiplexed over a single fiber link and then demultiplexed at the other end back to the same number of independent 10BASE-T links.

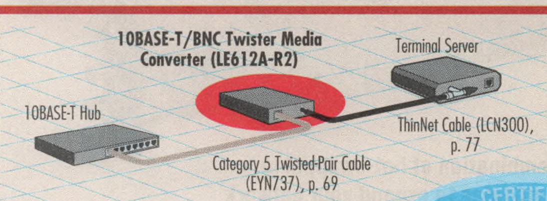
Connect File Servers in the Computer Room to the Network in Another Building.

The distance capabilities of fiberoptic cable enable you to consolidate all your servers in a separate area—even in another building—so they're always safe and always conveniently located when they need servicing.


Computer Room in Administration Building
10BASE-T/Fiber-ST Twister Media Converter (LE611A-ST-R2)
Network Server
Category 5 Unshielded Twisted-Pair Cable (EYN737), p. 69
Fiber Optic Cable (EFN062), p. 74
10BASE-T/Fiber-ST Twister Media Converter (LE611A-ST-R2)
10BASE-T Hub
Category 5 Unshielded Twisted-Pair Cable (EYN737), p. 69
PCs
Manufacturing

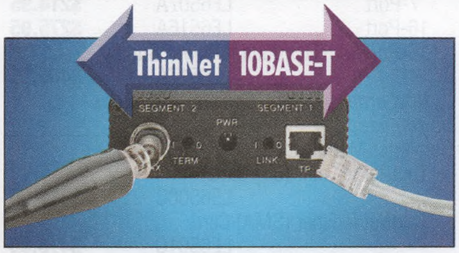
Add a Device with BNC Connectors to a 10BASE-T Network—No Repeater Needed!

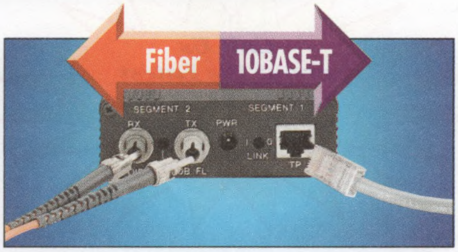
It doesn't matter what kind of connectors an Ethernet device has—you can attach it to your 10BASE-T network with a Twister Media Converter.


10BASE-T/BNC Twister Media Converter (LE612A-R2)
Terminal Server
10BASE-T Hub
ThinNet Cable (LCN300), p. 77
Category 5 Twisted-Pair Cable (EYN737), p. 69

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!

to Fiber, Thin Coax, Standard Ethernet, and More!


ThinNet
10BASE-T
SEGMENT 2
SEGMENT 1
PWR
TERM
LINK
TP


Fiber
10BASE-T
SEGMENT 2
SEGMENT 1
RX
TX
PWR
LINK
TP

SPECIFICATIONS

CE Approval — LE611A-ST, LE612A, LE614A-SMA, -ST, LE615A, LE2120A
Connectors — Media Converters:
Twisted pair: (1) Shielded RJ-45, (1) 8-pin jack;
Fiberoptic: (2) SMA or ST®;
Thin coax: (1) BNC internally connected to a 50-ohm switch-selectable terminator;
Standard (AUI): (1) DB15 female;
LE681A: (2) RJ-45 female;
LE2120A: (1) RJ-45, (1) ST
Power — LE2120A: 110–240 VAC, 60–50 Hz, external transformer;
All others: 115-VAC, 60-Hz external power supply (230-VAC, 50-Hz version on request)
Size — LE681A: 1.2"H x 7.3"W x 3.7"D (3 x 18.5 x 9.4 cm);
LE2120A: 2.3"H x 3.3"W 0.8"D (5.8 x 8.7 x 2 cm);
All others: 1.2"H x 3.8"W x 3.7"D (3 x 9.7 x 9.4 cm)
Weight — LE681A: 4 lb. (1.8 kg);
LE2120A: 0.2 lb. (<0.1 kg); 0.8 lb. (0.4 kg) with power supply;
All others: 1.4 lb. (0.6 kg), including power supply

FAXBACK INFORMATION
For the MicroConverter: 18595
For all others: 15138
Call 412-746-5500 Anytime

Item	Code	Price
Twister Media Converters		
10BASE-T/Fiber-ST	LE611A-ST-R2	**$372.95**
10BASE-T/Fiber-ST Ready Pak includes: the Converter **and** (**1**) 10-ft. Category 5 Patch Cable	LE611A-ST-R2-CABPAK	**$384.95**
10BASE-T/Fiber-SMA	LE611A-SMA	**$389.95**
10BASE-T/BNC	LE612A-R2	**$239.95**
10BASE-T/BNC Ready Pak includes: the Converter **and** (**1**) 10-ft. Category 5 Patch Cable	LE612A-R2-CABPAK	**$252.95**
10BASE-T/AUI	LE613A	**$214.95**
BNC/Fiber-SMA	LE614A-SMA	**$392.95**
BNC/Fiber-ST	LE614A-ST	**$369.95**
10BASE-T/Single-Mode Fiber	LE615A-R2	**$899.95**
Media Converter Extender (10BASE-T to 10BASE-T)	LE681A	**$295.00**
MicroConverter	LE2120A	**$249.00**
remember to order cables — Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		
Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
For other lengths or applications, see pp. 74 and 118.		

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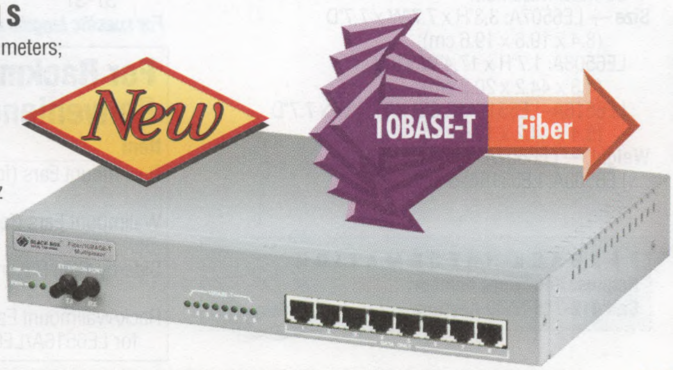
SPECIFICATIONS

Distance — 10BASE-T: Up to 100 meters; 10BASE-FL: Up to 2 kilometers
CE Approval — Yes
Connectors — (8) RJ-45, (1) ST
Indicators — (1) Power, (8) Activity, (1) Status
Power — 110–240 VAC, 60–50 Hz
Size — 1.75" H x 11.3"W x 7.5"D (4.4 x 28.1 x 18.5 cm)
Weight — 3.4 lb (1.5 kg)


New
10BASE-T
Fiber
BLACK BOX
Fiber/10BASE-T Multiplexor

FAXBACK INFORMATION
Request Document Number: 18588
Call 412-746-5500 Anytime

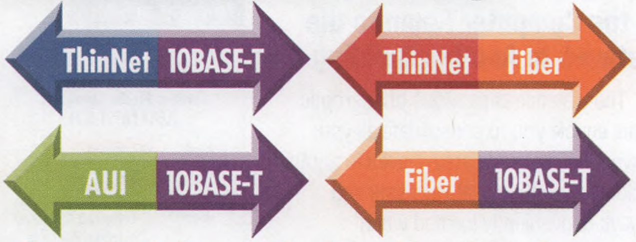
Item	Code	Price
Fiber/10BASE-T Multiplexor	LE2125A	**$1995.00**
remember to order cables — Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		
Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
For other lengths or applications, see pp. 74 and 118.		

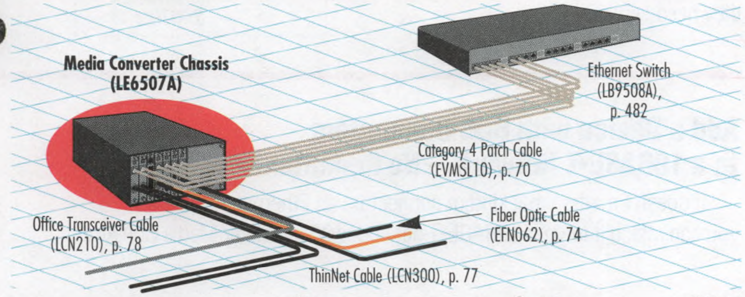
Print Servers
Packages
Full-Duplex
Transceivers/Fan-Outs
Single-Pair Networking
More LAN

Media Converter Chassis

Interconnect Multiple Standard, Thin, UTP, and Fiberoptic Segments without Recabling!

TECH SUPPORT'S PRODUCT OF CHOICE




Media Converter Chassis (LE6507A)
Ethernet Switch (LB9508A), p. 482
Category 4 Patch Cable (EVMSL10), p. 70
Office Transceiver Cable (LCN210), p. 78
Fiber Optic Cable (EFN062), p. 74
ThinNet Cable (LCN300), p. 77

- **Add any combination of hot-swappable converter modules to expand your network *fast*—just plug them in!**
- **Compact and rackmountable—just 2U high.**
- **Completely retimes and regenerates all data signals for low bit delays.**
- **Optional Redundant Power Supplies back up chassis should power failures occur.**

Simply plug in a Media Converter Chassis and connect your Ethernet segments—regardless of the cable type. Now you can interconnect any shielded or unshielded twisted-pair device to thick or thin coax, or fiberoptic cable. You can even connect coax devices to fiberoptic cable. All signal activity is translated, including collision data, so you get reliable communication.

The RJ-45 twisted-pair port supports shielded and unshielded twisted-pair cabling so you can connect 10BASE-T devices to the network. The user-selectable port configuration allows cross-pinned or straight-through segments. The fiber-optic connectors (ST® or SMA) give you a 1.2-mile (2-km) fiber link for remote capability. And the BNC connector supports 10BASE2 connections—an internal 50-ohm terminator means you don't need an external T-connector for BNC.

The Convenient Way to Translate Media.

If you only need to translate between two wiring systems, a standalone Media Converter will do the job. But as your network expands, you'll probably have many cable types to translate—that's why a Media Converter Chassis is a good choice. Select the appropriate chassis size, and then choose the converter modules for the multiple connections you need. Best of all, everything is housed in one box so you save space. And it's a snap to upgrade or replace modules so you don't waste time changing your network design.

Call Us about the Latest Additions to Our Media Converter Family.

SPECIFICATIONS

Indicators — Power, Collision, Activity, Link
CE Approval — LE6507A, LE6516A–LE6517A, LE6500C–LE6505C
Speed — 10 Mbps
Interface — UTP: (1) Shielded RJ-45, (1) 8-pin jack; Fiberoptic: (2) SMA or ST, RX; BNC: (1) BNC internally connected to a 50-ohm switch-selectable terminator; Standard (AUI): (1) DB15 female
Connectors — All: (1) 15-pin Edge;
LE6500C: (1) BNC female, (2) ST;
LE6501C: (1) BNC, (2) SMA;
LE6502C: (1) RJ-45 female, (2) ST;
LE6503C: (1) RJ-45, (2) SMA;
LE6504C: (1) RJ-45 female, (1) BNC;
LE6505C: (1) RJ-45 female, (1) DB15 female
Power — Internal to Chassis; 90–250 VAC, 50–60 Hz, 60 watts maximum
Size — LE6507A: 3.3"H x 7.7"W x 7.7"D (8.4 x 19.6 x 19.6 cm);
LE6508A: 1.7"H x 17.4"W x 8"D (4.3 x 44.2 x 20.3 cm);
LE6516A–LE6517A: 3.3"H x 17.4"W x 7.7"D (8.4 x 44.2 x 19.6 cm)
Weight — LE6507A: 3 lb. (1.4 kg);
LE6508A, LE6516A: 5 lb. (2.3 kg)

FAXBACK INFORMATION
Request Document Number: 13325
Call 412-746-5500 Anytime

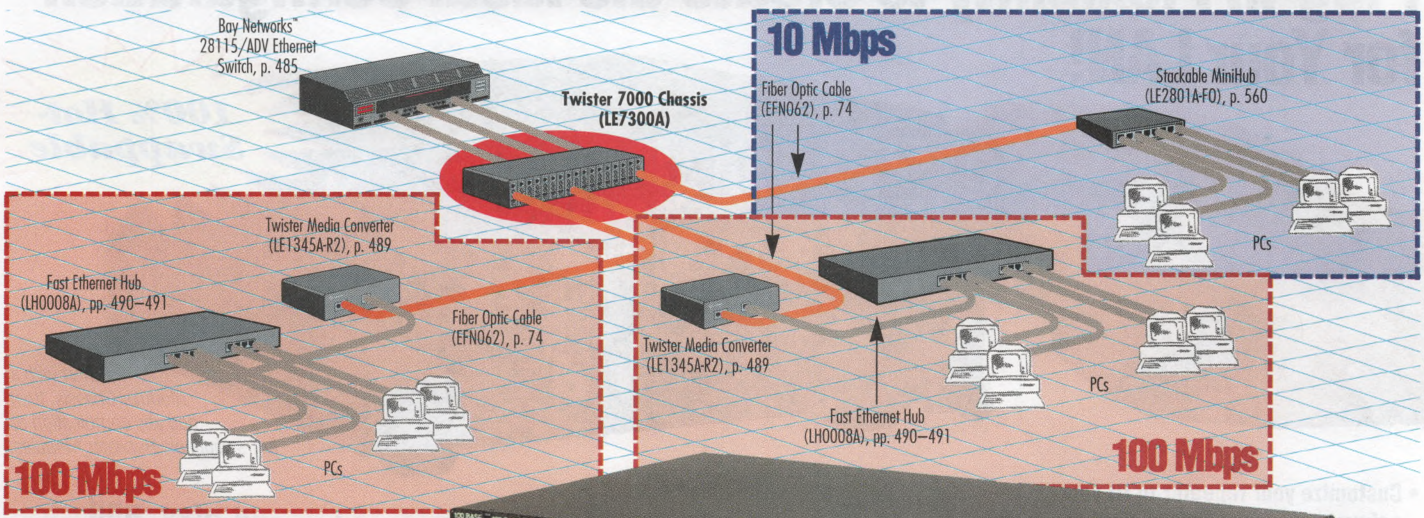
Item	Code	Price
First select the right-size Media Converter Chassis for your application...		
Media Converter Chassis		
7-Port	LE6507A	**$214.95**
16-Port	LE6516A	**$275.95**
16-Port with Redundant Power Supply	LE6517A	**$405.95**
...Next order as many Converter Modules as you need...		
Converter Modules		
ThinNet to Fiber (ST) Card	LE6500C	**$415.95**
ThinNet to Fiber (SMA) Card	LE6501C	**$415.95**
10BASE-T to Fiber (ST) Card	LE6502C	**$383.95**
10BASE-T to Fiber (SMA) Card	LE6503C	**$383.95**
10BASE-T to ThinNet Card	LE6504C	**$214.95**
10BASE-T to AUI Card	LE6505C	**$214.95**
...Finally, order at least one Redundant Power Supply...		
Redundant Power Supply		
for LE6507A	LE6519A	**$99.00**
for LE6516A	LE6518A	**$119.00**
To connect your Converters, order our...		
Blank Chassis Panel	LE6520A	**$15.00**
remember to order cables: Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		
Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
For specific lengths or bulk cables, see pp. 74 and 118.		

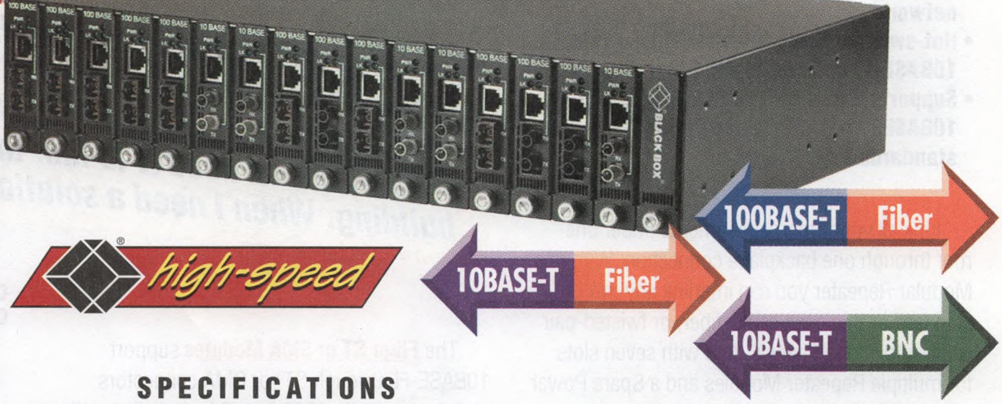
For Rackmount Convenience, You'll Need...

Item	Code	Price
Rackmount Ears (for LE6507A)	LE6521A	**$30.00**
Wallmount Ears (for LE6507A)	LE6522A	**$25.00**
Side-by-Side Rackmount (for LE6507A)	LE6523A	**$35.00**
Rack/Wallmount Ears for LE6516A/LE6517A	LE6525A	**$30.00**

The Twister 7000 Series

Mix and Match 10 and 100 Mbps with Virtually No Distance Limitations. Black Box Shows You How.


Bay Networks™ 28115/ADV Ethernet Switch, p. 485
Twister 7000 Chassis (LE7300A)
10 Mbps
Fiber Optic Cable (EFN062), p. 74
Stackable MiniHub (LE2801A-FO), p. 560
PCs
Twister Media Converter (LE1345A-R2), p. 489
Fast Ethernet Hub (LH0008A), pp. 490–491
Fiber Optic Cable (EFN062), p. 74
Twister Media Converter (LE1345A-R2), p. 489
PCs
Fast Ethernet Hub (LH0008A), pp. 490–491
100 Mbps
PCs
100 Mbps


high-speed
100BASE-T
Fiber
10BASE-T
Fiber
10BASE-T
BNC

- **Automatically operates in either half- or full-duplex.**
- **Rackmountable modular chassis for 10- and 100-Mbps modules.**
- **Optimized for media conversion using switches and routers from Cisco, 3Com®, Intel®, Bay Networks®, and Cabletron.**
- **Available with single or dual power supply for fully redundant operation.**
- **Accommodates up to 17 modules for both 10- and 100-Mbps Ethernet.**
- **Lowest delay of any 100-Mbps device on the market—only 15 bit times.**

Extend your Ethernet networks by using the long-distance capabilities of fiberoptic cable. With the Twister 7000 Series, you can mix 10BASE-T and 100BASE-T modules in a single convenient chassis ***and*** stretch your network up to 9.4 miles (15 km).

The Twister 7000 Series is easy to use—no hardware or software setup is required. Simply connect the Twister to the appropriate media. The modules provide minimum repeater delay and are totally transparent to normal network operations. And you can use the small rackmountable chassis to integrate and convert existing network segments—without losing your valuable workspace.

SPECIFICATIONS

Data Rate — 10-Mbps Module: 10 Mbps (half-duplex), 20 Mbps (full-duplex); 100-Mbps Module: 100 Mbps (half-duplex), 200 Mbps (full-duplex)

CE Approval — All items listed are approved

Connectors — 8-pin RJ-45; multimode or single-mode fiberoptic ST® or SC connector; BNC with selectable 50-ohm terminator

Indicators — Twisted-pair fiberoptic: Power and link; Twisted-pair BNC: Power, link, and collision

Power — 150 watts maximum; 115–230 VAC, 50–60 Hz, internal autosensing

Size — Interface Module: 3.5"H x 1"W x 4.6"D (8.9 x 2.5 x 11.7 cm); Chassis: 3.5"H x 17"W x 11.3"D (8.9 x 43.2 x 28.7 cm)

FAXBACK INFORMATION
Request Document Number: 17374
Call 412-746-5500 Anytime

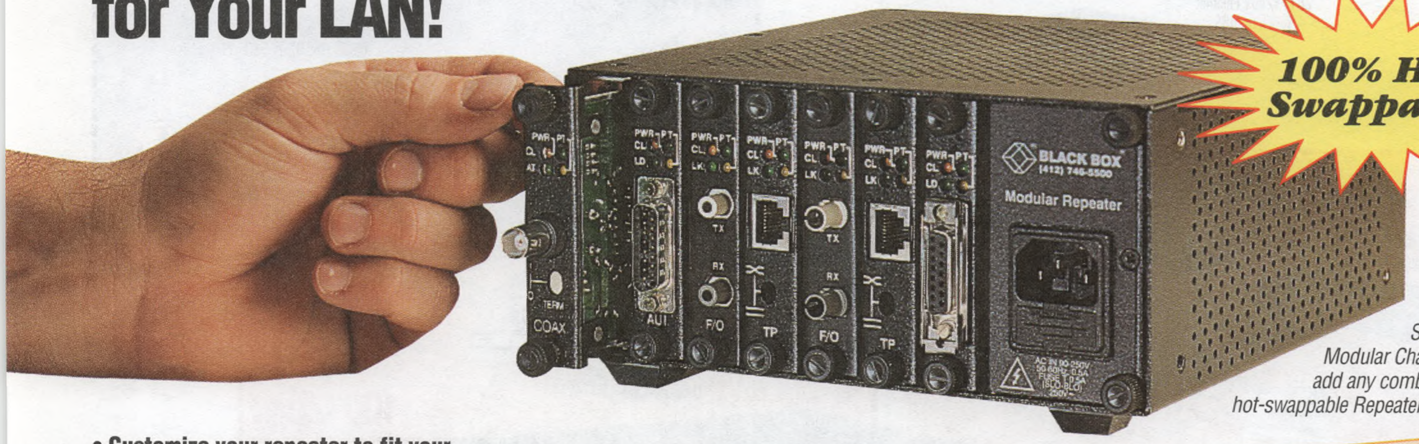
Item	Code	Price
Twister 7000 Chassis		
17-Slot Chassis		
Single Power Supply	LE7300A	**$469.00**
Dual Power Supply	LE7300A-PS	**$759.00**
10-Mbps Modules		
10BASE-T/BNC	LE7313C	**$189.00**
10BASE-T/Fiber-ST		
Multimode	LE7314C	**$269.00**
Single-Mode	LE7316C	**$819.00**
100-Mbps Modules		
100BASE-T/Fiber-SC		
Multimode	LH7414C	**$659.00**
Single-Mode	LH7416C	**$2199.00**
100BASE-T/Fiber-ST		
Multimode	LH7415C	**$659.00**
Blank Panel	LE7301A	**$24.00**
remember to order cables Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		
Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
For specific lengths or bulk cable, see pp. 74 and 118.		

LE7314-C LH7414-C LH7415-C

Print Servers | Packages | Full-Duplex | Transceivers/Fan-Outs | Single-Pair Networking | More LAN

Modular Repeaters

Plug-In Flexibility to Create the Ideal Configuration for Your LAN!



100% Hot-Swappable

Start with a Modular Chassis, then add any combination of hot-swappable Repeater Modules.

- **Customize your repeater to fit your network.**
- **Hot-swappable modules for Thick, Thin, 10BASE-T, and Fiberoptic Ethernet.**
- **Supports Ethernet IEEE 802.3 10BASE5, 10BASE2, 10BASE-T, and 10BASE-FL standards.**

> ***"This Modular Repeater is completely plug-and-play, and operation is 100% trouble-free! It's the perfect transparent interface for our application. We installed ours on the sixth floor and used it to link three other segments in the building. When I need a solution, I always call Black Box."***

Link all your Ethernet segments under one roof through one backplane connection. With this Modular Repeater you can interlink any mix of standard or thin coax cable, fiber, or twisted-pair segments in one Chassis. And with seven slots for multiple Repeater Modules and a Spare Power Supply, you have plenty of room to grow.

Offers Any-Medium-to-Any-Medium Flexibility.

The **ThinNet (BNC) Module** supports standard 10BASE2 connections, and it has an internal 50-ohm terminator that is switch-selectable and eliminates the need for a T connector.

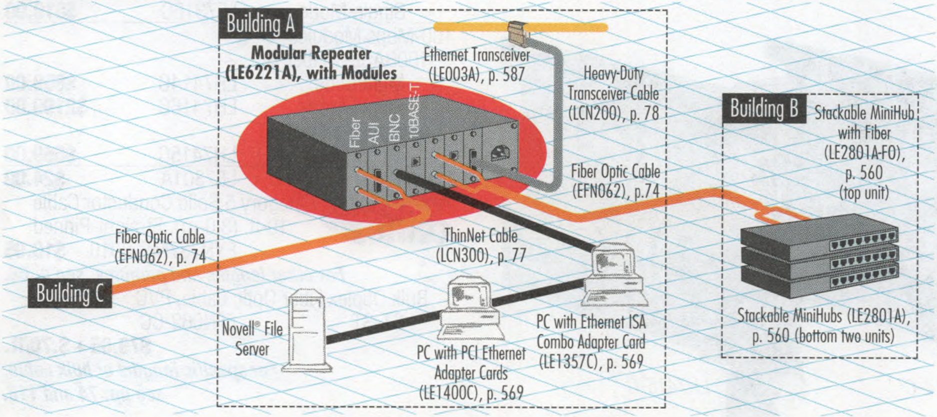
The **Thick Ethernet Module** (AUI female or AUI male) adds additional interfacing capability and flexibility.

The **10BASE-T (RJ-45) Module** connects any UTP or STP 10BASE-T device, and it can mix cable configurations via a switch-selectable cross-connection function.

The **Fiber ST or SMA Modules** support 10BASE-FL through ST® or SMA connectors at distances up to 6560 feet (2 km) via fiberoptic cable.

Each model has LEDs that keep you up to date on network activity. And it's easy to install. The connectors are located on the front panel. If space is tight, you can mount these units on a rack.

FAXBACK INFORMATION
Request Document Number: 15286
Call 412-746-5500 Anytime


Building A
Modular Repeater (LE6221A), with Modules
Fiber
AUI
BNC
10BASE-T
Ethernet Transceiver (LE003A), p. 587
Heavy-Duty Transceiver Cable (LCN200), p. 78
Fiber Optic Cable (EFN062), p.74
Building B
Stackable MiniHub with Fiber (LE2801A-FO), p. 560 (top unit)
Fiber Optic Cable (EFN062), p. 74
ThinNet Cable (LCN300), p. 77
Building C
Novell® File Server
PC with PCI Ethernet Adapter Cards (LE1400C), p. 569
PC with Ethernet ISA Combo Adapter Card (LE1357C), p. 569
Stackable MiniHubs (LE2801A), p. 560 (bottom two units)

SPECIFICATIONS

CE Approval — LE6221A
Connectors — LE6207-ST: (2) ST;
LE6207-SMA: (2) SMA;
LE6202: (1) BNC female;
LE6210: (2) RJ-45 female;
LE6205-F: (1) AUI female; LE6205-M: (1) AUI male
Indicators — All RIMs: (3) Port LEDs: Activity, Collision, Partition; (1) Power LED;
LE6207-ST, LE6207-SMA, LE6210: (1) Link Integrity LED;
LE6205-F, LE6205-M: (1) Load LED
Power — 115/230 VAC, 60/50 Hz (autoswitching)
Size — Chassis: 3.3"H x 7.5"W x 7.7"D (8.4 x 19 x 19.6 cm)
Weight — Chassis: 3 lb. (1.4 kg)

Item	Code	Price
Modular Repeater Chassis	LE6221A	**$529.00**
Modules		
ThinNet (BNC)	LE6202	**$105.00**
Thick Ethernet		
AUI Female	LE6205-F	**$115.00**
Male	LE6205-M	**$115.00**
10BASE-T (RJ-45)	LE6210	**$125.00**
Fiber		
ST	LE6207-ST	**$325.00**
SMA	LE6207-SMA	**$325.00**
Spare Power Supply	PS6221	**$99.00**

remember to order cables

Bulk Duplex Fiber Optic Cable, PVC
ST-ST EFN062-CC **$79.95 + $.70/ft.**
For plenum applications or other lengths, see p. 74 and 118.

ThinNet Cable, PVC, 10-ft. (3.0-m) LCN300-0010 **$17.95**
For plenum applications or other lengths, see p. 77.

Heavy-Duty Transceiver Cable, PVC, 10-ft. (3.0-m) LCN200-0010 **$51.70**
For plenum applications or other lengths, see p. 78.

Local Repeaters/Remote Fiberoptic Repeaters

Top-Quality, Standalone Repeaters for *All* Ethernet Media Types.

Now Available for Single-Mode Fiber Cable!

- **Internal autosensing power supplies for use at any voltage, 90 to 260 VAC.**
- **Support for all Ethernet media types, including standard or Thin coax, 10BASE-T, or fiber.**
- **Remote Fiberoptic Repeaters are compatible with 10BASE-FL and FOIRL standards for extended fiber connections.**
- **Remote Single-Mode Fiber Repeaters send data up to 10 kilometers.**
- **Guaranteed for life.**

BLACK BOX®
Remote Repeater
EXT
PART
RX
LINK
PART
RX
BLACK BOX®
Local Repeater
PWR RX JAB COL
EXT
PART
RX
PART
RX

Autosensing power supplies.

Just plug in these Repeaters. Their internal power supplies automatically adjust to any power source with AC voltage from 90 to 260 VAC and power input frequencies between 47 and 63 Hz.

Full Repeater functionality.

Each Repeater has port connections so you can connect two Ethernet segments. And each segment conforms to IEEE 802.3 specifications for length and number of nodes. You get precise transmission of your LAN data: Each unit performs full-signal regeneration and retiming.

Models for all interfaces.

There's a range of models, too. You can select just the right Repeater no matter what cable type you're using: standard or Thin coaxial cable, unshielded twisted pair, or fiberoptic.

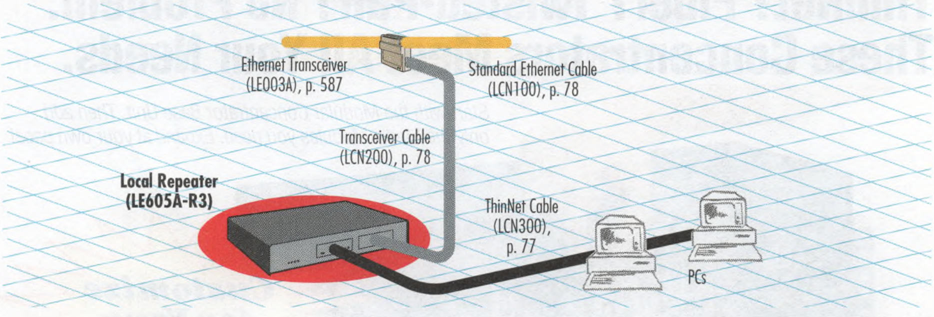
Local Repeaters.

With the Local models, you can connect or mix and match copper-based Ethernet segments.

Remote Fiberoptic Multimode Repeaters.

Break the Ethernet coax distance barrier for your network. Use the Remote units, with their fiberoptic connector ports, to get greater distances by linking two Ethernet segments via fiberoptic cable. The Remote Repeaters are 10BASE-FL compliant so you can make long-distance connections over a mile (2 km). And the Repeaters are fully backwards-compatible with FOIRL so you don't need to worry about integrating them into your network.

FAXBACK INFORMATION
Request Document Number: 10542
Call 412-746-5500 Anytime



SPECIFICATIONS

Standards — Depending on the unit: Ethernet V1.0/V2.0, IEEE 802.3, 10BASE5, 10BASE2, 10BASE-T, 10BASE-FL, FOIRL, DTE

CE Approval — All items listed are approved

Connectors — Fiberoptic: SMA or ST®;
ThinNet: BNC for RG-58A/U coax cable;
10BASE-T: RJ-45 female;
Standard Ethernet: DB15 female

Indicators — All models: PWR, RX, JAB, COL;
AUI and BNC ports: (1) Port, (1) RX per port;
10BASE-T and fiber ports: (1) Link, (1) Port, (1) RX per port

Power — Local and Remote Fiberoptic Multimode Repeaters: 90–260 VAC, 47–63 Hz (autosensing),15 watts;
Remote Single-Mode Fiber Repeaters: 115/260 VAC, 60/50 Hz, autosensing

Size — 1.8"H x 8.5"W x 5.4"D (4.6 x 21.6 x 13.7 cm)

Weight — 2.5 lb. (1.1 kg)

Item	Code	Price
Local Repeaters		
2 AUI	LE601A-R3	**$549.00**
2 BNC	LE602A-R3	**$569.00**
AUI/BNC	LE605A-R3	**$559.00**
BNC/10BASE-T	LE620A	**$349.00**
AUI/10BASE-T	LE622A	**$329.00**
10BASE-T/10BASE-T	LE624A	**$309.00**
Remote Fiberoptic Multimode Repeaters		
AUI/Fiber ST	LE603A-R4	**$669.00**
BNC/Fiber ST	LE604A-R4	**$689.00**
10BASE-T/Fiber ST	LE626A	**$649.00**
Multimode Fiber/Multimode Fiber ST	LE628A	**$719.00**
Remote Single-Mode Fiber Repeaters		
AUI/Single-Mode Fiber ST	LE629A	**$1245.00**
BNC/Single-Mode Fiber ST	LE630A	**$1245.00**
10BASE-T/Single-Mode Fiber ST	LE631A	**$1245.00**
Multimode/Single-Mode Fiber ST	LE632A	**$1395.00**
Single Mode/Single-Mode Fiber ST	LE633A	**$1795.00**

remember to order cables

Item	Code	Price
ThinNet Cable, PVC, 10-ft. (3.0-m)	LCN300-0010	**$17.95**
Standard Ethernet Cable, PVC, 77-ft. (23.5-m)	LCN100-0077	**$120.95**
Bulk Duplex Fiber Optic Cable, PVC, ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For plenum applications or other lengths, see p. 77.

See our full line of Ethernet Cables on pages 77–79.

For plenum applications or other lengths, see p. 74 and 118.

4-Port BNC Repeater

The Capable, Compact, Low-Cost Repeater.

Low-Cost
BLACK BOX
(412) 746-5500
4-Port BNC Repeater

- **Four ThinNet connectors plus an AUI connector for backbone connections.**
- **Compliant with Ethernet/IEEE 802.3, 10BASE2, and 10BASE5 standards.**
- **Switch-selectable port termination.**

New

The 4-Port BNC Repeater has everything you're looking for: full IEEE 802.3 compliance, a small footprint, switch-selectable termination, an AUI port for backbone connections, LEDs at every port—and a very reasonable price.

It's ideal for workgroups. All ports are functionally equivalent, and Ethernet devices can be connected directly to the Repeater.

The Repeater installs easily without tools and, once installed, configures itself.

Internal network management constantly monitors each port for signal quality, ensuring packet integrity across the network.

SPECIFICATIONS

Distance — ThinNet: 185 meters;
Standard Ethernet: 50 meters
CE Approval — Yes
Connectors — (4) BNC, (1) AUI
Indicators — LEDs: (1) Power, (1) Collision, (4) Activity, (4) Partition
Power — 115–230 VAC, 60–50 Hz, autosensing
Size — 1.7"H x 8.9"W x 6.7"D (4.3 x 22.6 x 17 cm)
Weight — 3 lb. (1.4 kg)

FAXBACK INFORMATION
Request Document Number: 18605
Call 412-746-5500 Anytime

Item	Code	Price
4-Port BNC Repeater	LE8003A	**$370.00**
remember to order cables — ThinNet Cable, PVC 10-ft. (3.0-m)	LCN300-0010	**$17.95**

For plenum applications or other lengths, see p. 77.

◆ ◆ ◆

Modular Concentrators

ThinNet? Fiber? Twisted-Pair? No Problem. These Concentrators Meet All Your Needs.

Start with the Modular Concentrator Base Unit. Then add only the Media Modules you need. Expand at your own pace!

BLACK BOX
MODULAR CONCENTRATOR
Customize for Your Needs!

Customize these IEEE 802.3-compliant Modular Concentrators yourself. They're available with 2, 5, or 12 slots for installing any combination of multi-segment Hub Modules (HMs) for thin coax, twisted-pair, and fiberoptic cabling.

Each Hub Module features an additional slot for installing single-segment Repeater Interface Modules (RIMs) to add an additional segment to each Hub Module in the chassis. All Modules are hot-swappable so you can configure them at any time, in any combination—without bringing down the entire LAN.

- **Multi-segment Hub Modules to fit any network—10BASE2, 10BASE-T, 10BASE-FL/FOIRL.**
- **Add extra backbone connections with single-segment Repeater Interface Modules (RIMs).**
- **Configure with multiple collision domains for increased network performance.**
- **Field-installable SNMP Hub Management Module (HMM) upgrades unmanaged units fast—with no loss of media slots.**
- **Hot-swappable Hub Modules enable you to make changes without interrupting your LAN!**
- **Fully IEEE 802.3 compliant.**

FAXBACK INFORMATION
Request Document Number: 13930
Call 412-746-5500 Anytime

SPECIFICATIONS

CE Approval — LE6402A–LE6403A, LE6405A–LE6406A, LE6412A–LE6413A, LE6420–LE6423, LE6425–LE6427
Connectors — LE6420: (8) RJ-45 for 10BASE-T, 1 RIM slot;
LE6421: (1) Telco for (8) 10BASE-T, 1 RIM slot;
LE6422: (5) BNC for 10BASE2, 1 RIM slot;
LE6423: (4) ST II for 10BASE-FL/FOIRL, 1 RIM slot
Indicators — LEDs: JAM, Error for each BNC segment, and Error and Link for each twisted-pair and fiberoptic link segment
Power — 115 VAC, 60 Hz
Size — /2 Models: 1.8"H x 17.5"W x 6.8"D (4.6 x 44.5 x 17.3 cm);
/5 Models: 3.5"H x 17.5"W x 6.8"D (8.9 x 44.5 x 17.3 cm);
/12 Models: 5.3"H x 17.5"W x 6.8"D (13.3 x 44.5 x 17.3 cm)
Weight — /2 Models: 8.5 lb. (3.9 kg);
/5 Models: 11 lb. (5 kg);
/12 Models: 15.5 lb. (7 kg)

Item	Code	Price
Rackmount Modular Concentrator Chassis Base Unit		
/2 (Unmanaged)	LE6402A	**$530.00**
(w/SNMP HMM)	LE6403A	**$1030.00**
/5 (Unmanaged)	LE6405A	**$800.00**
(w/SNMP HMM)	LE6406A	**$1500.00**
/12 (Unmanaged)	LE6412A	**$1000.00**
(w/SNMP HMM)	LE6413A	**$1900.00**
Hub Modules (HMs)		
TP/8	LE6420	**$310.00**
TP/8, Telco	LE6421	**$310.00**
BNC/5	LE6422	**$630.00**
FO/4, ST® II*	LE6423	**$900.00**
*SMA connectors available on special order.		
Repeater Interface Modules (RIMs)		
BNC	LE6102	**$150.00**
AUI	LE6105	**$159.00**
Fiber Optic, ST II	LE6107-ST	**$280.00**
Fiber Optic, SMA	LE6107-SMA	**$280.00**
Workstation	LE6109	**$159.00**
10BASE-T	LE6110	**$95.00**
SNMP Hub Management Modules (SNMP HMMs)		
for Mod Concentrator /2	LE6425	**$550.00**
/5	LE6426	**$900.00**
/12	LE6427	**$1100.00**
Rackmount Brackets for LE6402A and LE6403A	RM6400	**$20.00**
remember to order cables — Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

WorkGroup Repeaters

Extend Your Ethernet LAN *and* Link Mismatched Media.

- **Compact, dual-port Repeaters add extra distance to your LAN—up to 1.2 miles (1.9 km), depending on your cable.**
- **Choose from 15 models with a variety of connectors. The *perfect* solution for linking mismatched media.**
- **Autopartitioning adds fault-tolerance by isolating troublesome segments from the rest of your LAN.**
- **Get full support for 10BASE5, 10BASE2, 10BASE-T, FOIRL, and 10BASE-FL.**

remember to order cables See our Cable Section, on pp. 64–113.

BLACK BOX® compact WorkGroup Repeaters are the perfect solution for adding remote workgroups quickly or extending the range of your LAN. Their slim design makes them easy to install virtually anywhere. In fact, with their autosensing power supplies, they're compatible with AC sources around the globe.

Autopartitioning.

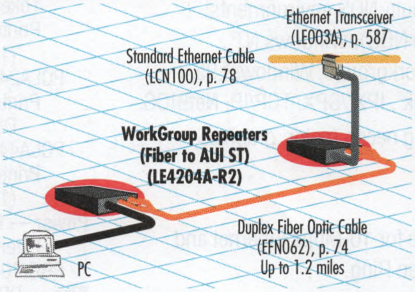
Whenever there's a failure on one of the connected Ethernet segments, the Repeater effectively closes access to the failed link, enabling data traffic on the remaining segment to continue unaffected. When the problem is resolved, the Repeater reactivates the connection automatically—instantly restarting normal communications.

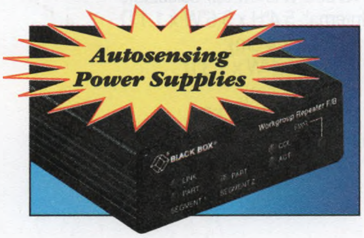
Special Features—Built Right In.

Repeaters with BNC connectors feature user-selectable manual termination, so you can attach your network segment directly without a T-connector and a separate terminator. UTP models with RJ-45 connectors automatically detect and correct reversed polarity.

Choose Fiber Models for Extra-Long Distances.

The benefit of any Repeater is the extra distance it adds to your LAN. But for *really* long-range links between coax or twisted-pair segments, use our fiberoptic Repeaters and run cable up to 1.2 miles (1.9 km).





SPECIFICATIONS

CE Approval — All items listed are approved

Connectors — Fiberoptic: SMA or ST; ThinNet: BNC for RG58 coax cable; 10BASE-T: RJ-45 female; Standard Ethernet: DB15 female

Indicators — Each unit has (3) LEDs forPower, Activity, and Collision, plus (2) for Partition (one for each segment); Units with FO or UTP ports have (1) link LED per FO or UTP connector

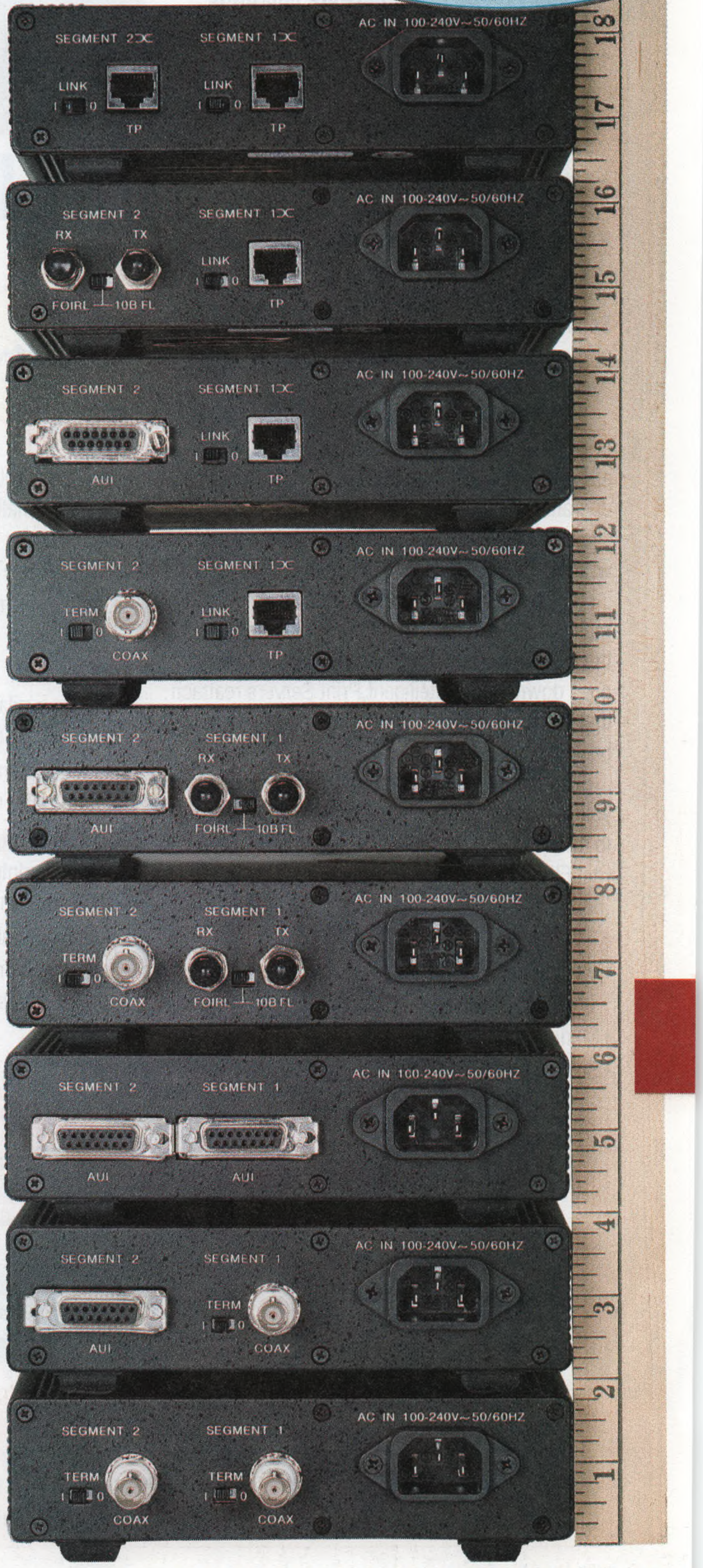
Power — 120 VAC, 1 A, external power supply

Size — 1.2"H x 3.8"W x 7.5"D (3 x 9.7 x 19.1 cm)

Weight — 1.8 lb. (0.8 kg) with power module

FAXBACK INFO
Request Document Number: 15145
Call 412-746-5500
Anytime

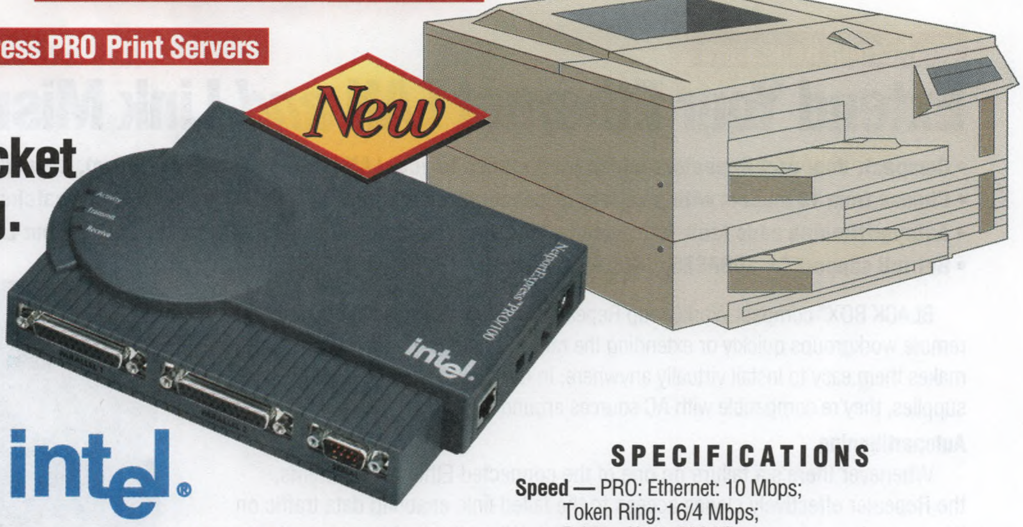
Item	Code	Price
WorkGroup Repeaters		
BNC/BNC	LE4200A-R2	**$380.00**
AUI/BNC	LE4201A-R2	**$475.00**
AUI/AUI	LE4202A-R2	**$450.00**
Fiber/BNC		
ST®	LE4203A-R2	**$680.00**
SMA	LE4203A-SMA-R2	**$680.00**
Fiber/AUI		
ST	LE4204A-R2	**$665.00**
SMA	LE4204A-SMA-R2	**$665.00**
BNC/UTP	LE4205A-R2	**$310.00**
AUI/UTP	LE4206A-R2	**$310.00**
Fiber/Fiber		
ST/ST	LE4207A-R2	**$755.00**
SMA/SMA	LE4207A-SMA-R2	**$755.00**
ST/SMA	LE4207A-ST/SMA-R2	**$755.00**
Fiber/UTP		
ST	LE4208A-R2	**$680.00**
SMA	LE4208A-SMA-R2	**$680.00**
UTP/UTP	LE4209A-R2	**$310.00**
remember to order cables	Category 5 Solid Conductor Cable, 10-ft. (3.0-m), Straight-Pinned EYN737MS-0010	**$10.95**
	For other lengths and pinnings, see p. 68.	
Bulk Duplex Fiber Optic Cable, PVC		
ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
	For other lengths, see p. 74. Specify gender when ordering.	
ThinNet Cable, 20-ft. (6.1-m)		
PVC	LCN300-0020	**$20.95**
	For plenum applications or other lengths, see p. 77.	



Print Servers
Packages
Full-Duplex
Transceivers/ Fan-Outs
Single-Pair Networking
More LAN

Intel NetportExpress and NetportExpress PRO Print Servers

Top-Rated Intel Print Servers—Just the Ticket for Total Print Sharing.



- **Support for all major network operating systems and management consoles.**
- **Protects your equipment investment, by adding new life to older printers.**
- **One easy-to-use tool for installation and configuration.**
- **External and internal Print Server solutions for your network printing.**
- **Three-year hardware warranty from Intel.**

intel®

With the Intel® NetportExpress™ family of Print Servers, you can connect virtually any kind of printer anywhere you need it via your network backbone cable.

Forget distance limits or having to attach printers right next to your servers. Plug them in anywhere your network goes—no matter what operating system or printer you have. You can even attach older-model printers regardless of whether they have dedicated expansion slots.

The compact design of these Print Servers makes them easy to install without disrupting the rest of your network. In fact, if your network goes down, these intelligent Print Servers reattach themselves dynamically once your LAN comes back on line.

No matter what kind of LAN you're running, you're sure to find the Intel Print Server you need to make your printer connections—for Ethernet, Fast Ethernet, or Token Ring.

All Models

- Perfect for NetWare® only environments (includes native NDS™ support for NetWare 4.1).
- Medium-volume, high-performance printing.
- Small-to-medium network size.

Total Network Printer Control!

- Multiprotocol/multi-NOS environments: NetWare (native NDS), Windows NT™, Windows for Workgroups, Windows® 95, UNIX®, AppleTalk®, IPX™/SPX, TCP/IP, NetBIOS.
- Complex printing needs (color, graphics, bitmaps).

PRO Models

- Models available for 10-Mbps Ethernet and 16/4-Mbps Token Ring.
- Support internal MIO connections or external multi-printer connections.

PRO/100 Models

- External printer connections for 10- or 100-Mbps environments (autosensing).
- Support for all makes of printers.
- 1-port version offers one parallel port; 3-port version offers two parallel and one serial port.

NETWORK COMPUTING
EDITOR'S CHOICE

LAN TIMES
READERS CHOICE
1995

MORE! Intel® Products, **see pp. 495–496, 498, 536, 549–552, 568, 599–600.**

FAXBACK INFORMATION
Request Document Number: 17604
Call 412-746-5500 Anytime

intel. *from* BLACK BOX

Why? Support without the Wait.

You get Black Box Tech Support—the best in the business—from Intel trained technicians. And we answer in 3 to 5 rings!

SPECIFICATIONS

Speed — PRO: Ethernet: 10 Mbps;
Token Ring: 16/4 Mbps;
Printer: Up to 200 KBps;
PRO/100: Network: 10/100 Mbps (autosensing);
Printer: Up to 200 KBps

CE Approval — All items listed are approved

Connectors — PRO: Internal: Ethernet: (1) RJ-45, (1) BNC;
Token Ring: (1) DB9, (1) RJ-45;
Printer: MIO;
External: Ethernet: (1) RJ-45, (1) BNC;
Token Ring: (1) DB9, (1) RJ-45;
Printer: (2) IEEE 1284 parallel, (1) DB9 male serial;
PCLA2451: LAN: (1) 10/100 RJ-45;
Printer: (2) female DB25 parallel, (1) male DB9 serial, (1) 5-pin mini DIN power;
PCLA4451: LAN: (1) 10/100 RJ-45;
Printer: (1) female DB25 parallel, (1) 5-pin mini DIN power

Power — PRO: Internal: From the printer;
External: 115/230 VAC switch-selectable;
PRO/100: 115/230 VAC switch-selectable

Size — PRO: Internal: 5.4"H x 5.6"W x 1.1"D (11.6 x 12.1 x 2.4 cm);
External: 7.3"H x 5.1"W x 1.3"D (15.7 x 11 x 2.8 cm);
PRO 100: 7.3"H x 5.1"W x 1.3"D (15.7 x 11 x 2.8 cm)

Item	Code	Price
Intel NetportExpress Print Servers		
Ethernet		
PRO Internal	PCLA3151	**$299.00**
External	PCLA2151	**$379.00**
Token Ring		
PRO Internal	PCLA3351	**$459.00**
External	PCLA2351	**$529.00**
Intel NetportExpress PRO/100 Print Servers		
1-Port 1-Pack	PCLA4451	**$379.00**
3-Pack	PCLA4451PAK3	**$939.00**
3-Port 1-Pack	PCLA2451	**$459.00**
remember to order cables: Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned PVC	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

NOTE: Standard discounts may not apply.

In This Section...
More LAN
Hubs
Adapters/ PC Cards
Media Converters
Repeaters

Ethernet Multiprotocol Print Servers

Install 'em Quickly—They'll Print Files Even Faster!

- Share printers among multiple users running multiple protocols.
- Centralized management and diagnostics—even in Windows or Inter/Intranet environments.
- Installs easily without software. Instructions are printed on the unit.
- Output ports support speeds up to 600 Kbps.
- Choose NOS, cable topology, and number of ports.

UNIPORT
RXD
Status
Thinnet
ETHERNET
10BaseT
BLACK BOX
ETHERNET NETWORK
10BaseT
Thinnet
UNIPORT
PARALLEL PRINTERS
PORT 2
PORT 1
POWER

LB3901C-R2

LB3900A-R2

SPECIFICATIONS

CE Approval — LE3901C-R2;
230-VAC versions: LE3810AE-R3, LE3840AE-R3, LE3845AE-R3, LE3900AE-R2, LE3900AE-LAT

Power — LE3901C-R2: From interface;
All Standalone Units: 115-VAC input, 5VDC 1A output, external transformer, power consumption 15VA

Size — 1- and 3-Port Models: 2"H x 7"W x 4"D (5 x 17.8 x 10.2 cm);
All Other Standalone Models: 2"H x 8.5"W x 5"D (5 x 21 x 12.7 cm)

Weight — 1- and 3-Port Models: 1.3 lb. (0.6 kg) without power supply;
All Other Standalone Models: 1.6 lb. (0.7 kg) without power supply

Application Features:

Windows:

- Best Windows NT™ installation and printing.
- Fully compatible with Internet Explorer.
- NSDOCTOR configuration and management.
- Supports DMCP, LPT/LPD, and more.

Internet/Intranet:

- Manage and configure print servers from any location with Web-based management.
- Supports IP and UNIX®.
- Get manuals and upgrades via the Internet.

Novell Netware:

- Supports Novell® Link State Protocol (NLSP), IPX™ Peer-to-Peer printing, and NDS.
- Common GUI management for IPX and IP protocols enables you to migrate easily from NetWare® to Internet environments.

FAXBACK INFORMATION
Request Document Number: 15262
Call 412-746-5500 Anytime

BUYER'S GUIDE

ETHERNET PRINT SERVERS

Server Name	Printer Supported Total	Printer Supported Types	10BASE-T/ or ThinNet	NOS Support NetWare® Directory Services	NetWare or ThinNet	DEC™ LAT™	UNIX® & Windows NT™	Apple®	Flash ROM	Code	Price
10BASE-T	1	1P	10BASE-T		✓					LE3802A	**$245.00**
1-Port	1	1P	10BASE-T	✓	✓		✓		✓	LE3810A-R3	**$345.00**
3-Port Multiprotocol	3	2P; 1S/P	Both	✓	✓		✓	✓	✓	LE3900A-R2	**$495.00**
3-Port for LAT	3	2P; 1S/P	Both			✓	✓	✓	✓	LE3900A-LAT	**$595.00**
5-Port	5	4P; 1S/P	Both	✓	✓				✓	LE3840A-R3	**$795.00**
5-Port Multiprotocol	5	4P; 1S/P	Both	✓	✓		✓	✓	✓	LE3845A-R3	**$895.00**
Multiprotocol Card	2	1HP MIO; 1S/P	Both	✓	✓		✓	✓	✓	LE3901C-R2	**$495.00**
Uniport Adapter										LT310A	**$90.00**

remember to order **cables**

Item	Code	Price	
Category 5 Solid Conductor Cable, 10-ft. (3.0-m), Straight-Pinned, PVC	EYN737MS-0010	**$10.95**	***For other lengths and pinnings, see p. 68.***
Parallel Printer Cable, 10-ft. (3.0-m), Male/Male	EYN600-0010-MM	**$16.95**	***For other lengths and genders, see p. 106.***

3Com OfficeConnect Severs

Share Printers, Fax Machines, and CD-ROMs!

3Com®

- **Enables all connected users to share print, fax, and CD-ROM servers—directly from their desktop!**
- **Increases productivity without bogging down your network.**
- **Easily incorporates with other 3Com OfficeConnect products.**

Print Server—Two high-speed IEEE 1284 bidirectional parallel ports and a sophisticated print-queue manager keep print jobs flowing fast.

Fax Server—A built-in 14.4-Kbps fax modem ensures high-quality outgoing faxes and outputs faxes directly to plain-paper printers.

CD-ROM Server—This multiprotocol unit provides a direct-to-LAN link for up to seven SCSI-chained CD-ROM drives. Get direct access to CD-ROM drives while keeping traffic away from other servers. Users from any network environment can simultaneously access multiple drives regardless of the protocol.

CE Approval — All items listed are approved

FAXBACK INFORMATION
Request Document Number: 18801
Call 412-746-5500 Anytime

New
CASTELLE
CASTELLE

Item	Code	Price
3Com® OfficeConnect® Servers		
Print Server	66298600739	**$399.00**
Fax Server	66298600745	**$1359.00**
CD-ROM Server	66298600932	**$795.00**

remember to order **cables**

Item	Code	Price
Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned PVC	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

PCMCIA Print Server

The Most Flexible Print Server—Just Plug In Your PCMCIA LAN Card and Go to Work.

- **Compact, flexible and *fast* print serving for *any* network topology.**
- **Holds any industry-standard PCMCIA network interface card.**

PLUS! Fast Ethernet PC Cards **p. 497**, Ethernet PC Cards **p. 571**, and Token Ring PC Cards **p. 601.**

This PCMCIA print server chassis offers the most flexible, comprehensive network access possible. Use it with any network topology—Ethernet, Token Ring, Fast Ethernet. All you need is your own PCMCIA network interface card and you're ready for business. Simply plug your card into the PCMCIA Print Server chassis, then plug the chassis directly into your printer.

Thanks to its modular design, one BLACK BOX® PCMCIA Print Server gives you universal printer access from any LAN!

Need to change from Ethernet to Token Ring or vice versa? Swap your low-cost PCMCIA network interface cards. The PCMCIA Print Server eliminates the need for separate, expensive standalone network Print Servers. And it's the *perfect solution* for anyone who needs to deliver the best performance at the lowest cost.

The PCMCIA Print Server delivers the same terrific performance on large or small LANs. It supports any industry-standard PCMCIA card. The chassis detects the characteristics of your PCMCIA network card, so there's no need for complicated reconfiguration. Just plug in the card and start printing. A Velcro® kit is included *FREE* so you can conveniently install the Server wherever you need it.

Platforms Supported:

- Novell® NetWare®
- OS/2®, DEC™ LAT™
- UNIX®
- Windows NT™
- Windows® for Workgroups
- Mac® OS

Protocols Supported:

- SPX/IPX™
- TCP/IP
- NCP/IPX
- UDP/IP
- NetBEUI
- LAT
- DLC
- AppleTalk®

SPECIFICATIONS

Speed — Up to 80 KBps
Interface — Centronics® parallel
Connectors — DB25 female
Power — From the printer interface
Size — 0.3"H x 6.5"W x 1.2"D (0.8 x 16.5 x 3 cm)
Weight — 1 lb. (0.5 kg)

FAXBACK INFORMATION
Request Document Number: 16074
Call 412-746-5500 Anytime

Item	Code	Price
PCMCIA Print Server	LE3701A	**$369.00**
To complete your connection, choose...		
Fast Ethernet PC Card	LH1000A	**$429.00**
Ethernet PC Card		
UTP	LE7003A-UTP	**$169.00**
Combo	LE7003A-CMB	**$189.00**
Token Ring PC Card	LT8001A	**$445.00**
remember to order cables Category 5 Solid Conductor Cable, 4-Pair 10-ft. (3.0-m), Straight-Pinned		
PVC	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

Ethernet Print Server MP-1

TCP/IP? NetWare? AppleTalk? Windows NT? This Print Server Handles Them All.

Most networks today run more than one protocol. With the BLACK BOX® Ethernet Print Server MP-1, you can queue print jobs from hosts running NetWare, TCP/IP, AppleTalk, and Windows NT—all at the same time! You can even run serial and parallel printers, too!

You don't need to buy any extra host software or firmware. Everything you need is included. And for TCP/IP systems supporting Berkeley Remote Printing, the Print Server has the UNIX print daemon on board.

Again, you need no extra host software. (Other multiprotocol servers do demand more software.) Native LP or LPR printing is supported via RTEL software (included).

When the Print Server boots, you don't have to wait for software to download from the host. It stores its executable code in Flash ROM.

SPECIFICATIONS

Protocol — NetWare IPX/SPX 2.2 or 3.x, TCP/IP, AppleTalk, NetBEUI
System Requirements — Ethernet-based network running one or more of the following: NetWare, TCP/IP, AppleTalk, Windows NT
CE Approval — 230-VAC version: LE3700AE-R2
Speed — 300 bps to 64 Kbps
Connectors — (1) DB25 female for Centronics® or Dataproducts®, (1) DB15 AUI female, (2) RJ-45, (1) RS-423 (RS-232 compatible) for the serial link, and (1) for the 10BASE-T network connection
Indicators — (7) LEDs: Power, Polarity, Good Link, OK, Network, Parallel, Serial
Power — 12.7 to 18 VDC, 1 Amp (AC converter included)
Size — 0.9"H x 3"W x 5.3"D (2.3 x 7.6 x 13.5 cm)
Weight — 0.5 lb. (0.2 kg)

Now available for DEC™ LAT™ OS. Call Tech Support for More Info.

POWER
POLARITY
GOOD LINK
BLACK BOX®
ETHERNET PRINT SERVER MP-1
OK
NETWORK
PARALLEL
SERIAL
PARALLEL
SERIAL

Item	Code	Price
Ethernet Print Server MP-1	LE3700A-R2	**$499.00**
remember to order cables Category 5 Solid Conductor Cable, 4-Pair 10-ft. (3.0-m), Straight-Pinned		
PVC	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		
Parallel Printer Cable, 10-ft. (3.0-m) Male/Male	EYN600-0010-MM	**$16.95**

For other lengths and genders, see p. 106.

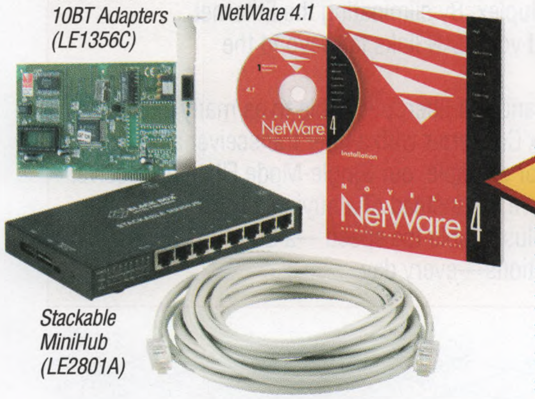
BLACK BOX SOLUTIONS

"I run a small company and want to network a group of PC users. I'm not sure where to start. What equipment and software do I need? And, if necessary, can I expand the network later?"

You've come to the right place! The answer to all your questions is our **new MiniLAN Workgroup Packages**. These new Packages contain *everything* you need to set up a small Ethernet network: Black Box's most popular 10BASE-T Hub, cable, network interface cards, and software.

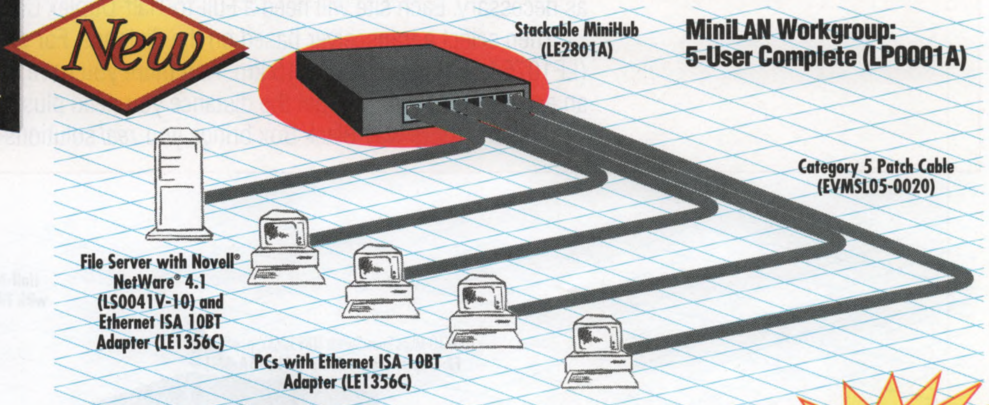
Or, if you already have networking software or prefer a different program, we offer these Workgroup Packages without software. Either way, just order the Package you need for the number of users you have. That's it—everything's included! It's fast, easy, and best of all, a money saver. In fact, you can save anywhere from $46 to $1200 by buying these pre-assembled Packages.

You can even expand your network in the future—just add another Workgroup Package!


Ethernet ISA 10BT Adapters (LE1356C)
Novell NetWare 4.1
Stackable MiniHub (LE2801A)

Category 5 Patch Cable (EVMSL05-0020)

Everything You Need to Network a Small Office—and Save Big!


New
Stackable MiniHub (LE2801A)
MiniLAN Workgroup: 5-User Complete (LP0001A)
Category 5 Patch Cable (EVMSL05-0020)
File Server with Novell® NetWare® 4.1 (LS0041V-10) and Ethernet ISA 10BT Adapter (LE1356C)
PCs with Ethernet ISA 10BT Adapter (LE1356C)

For more details on the Package components, see page 560 for the Stackable MiniHub, and page 569 for the Ethernet Adapters. Turn to page 69 for Category 5 Patch Cable. See NetWare 4.1 on pages 556–557.

Save up to $1200!

MiniLAN Workgroup Packages

1. **Start with a Stackable MiniHub.**
   - Use all eight RJ-45 10BASE-T ports.
   - Link up to four Stackable MiniHubs for a total of 32 users.
2. **Add an Ethernet ISA 10BT Twisted-Pair Adapter to each user PC.**
   - Just plug in the Cards. They take care of the details.
   - Works with all major operating systems.
3. **Make the connection with CAT5 Cables.**
   - 100-MHz certified for Fast Ethernet networks.
   - Beige cable comes in 20-ft. (6.1-m) lengths.
   - This 4-pair stranded cable is 24 AWG.
4. **Install Novell® NetWare®.**

BUYER'S GUIDE

THE MINILAN WORKGROUP PACKAGES INCLUDE:

MiniLAN Workgroup Packages		Package Components (Quantity)			
		Stackable MiniHub (LE2801A)	Ethernet ISA 10BT Adapters (LE1356C)	Category 5 Patch Cable (EVMSL05-0020)	NetWare 4.1 10-, 25-User (LS0041V)
with NOS	5-User (LP0001A)	1	5	5 Cables	10-User
	10-User (LP0002A)	2	10	10 Cables	25-User
without NOS	5-User (LP0005A)	1	5	5 Cables	
	10-User (LP0006A)	2	10	10 Cables	

SPECIFICATIONS

Stackable MiniHub (LE2801A)
Standards — IEEE 802.3 10BASE-T
Connectors — (8) RJ-45, (1) DB15 AUI
Indicators — LEDs: (1) PWR, (1) COL, (8) LNK/TX, (8) POL/RX
Power — 115 VAC, 60 Hz
Size — 1"H x 6.8"W x 4"D (2.5 x 17.1 x 10.1 cm)
Weight — 1 lb. (0.5 kg)

Ethernet ISA 10BT Adapter
Drivers — NE2000™, run standard drivers with Windows for Workgroups, Windows® 95, Windows NT™, NetWare, and UNIX®
Connectors — RJ-45
Interface — ISA and Plug-and-Play 1.0; Hardware parameters configurable by standard Plug-and-Play drivers or Windows 95

COST PER NODE

Workgroup with NOS		
5-User	LP0001A	$450.00
10-User	LP0002A	$355.00
Workgroup without NOS		
5-User	LP0005A	$97.00
10-User	LP0006A	$94.00

FAXBACK INFORMATION
Request Document Number: 16782
Call 412-746-5500 Anytime

Item	Code	Price
MiniLAN Workgroup with NOS Packages		
5-User	LP0001A	$2250.00
10-User	LP0002A	$3550.00

Item	Code	Price
MiniLAN Workgroup without NOS Packages		
5-User	LP0005A	$485.00
10-User	LP0006A	$945.00

Print Servers | Packages | Full-Duplex | Transceivers/Fan-Outs | Single-Pair Networking | More LAN

Boost LAN Data Rates over the Long Haul—with Half-to-Full-Duplex Converters from Black Box.

BLACK BOX SOLUTIONS

"Our company has two remote work sites that we'd like to connect to our main network. Unfortunately, these sites are beyond the standard 2-km limit for a fiberoptic Ethernet connection. How can I link the remote sites without sacrificing speed on our local LAN?"

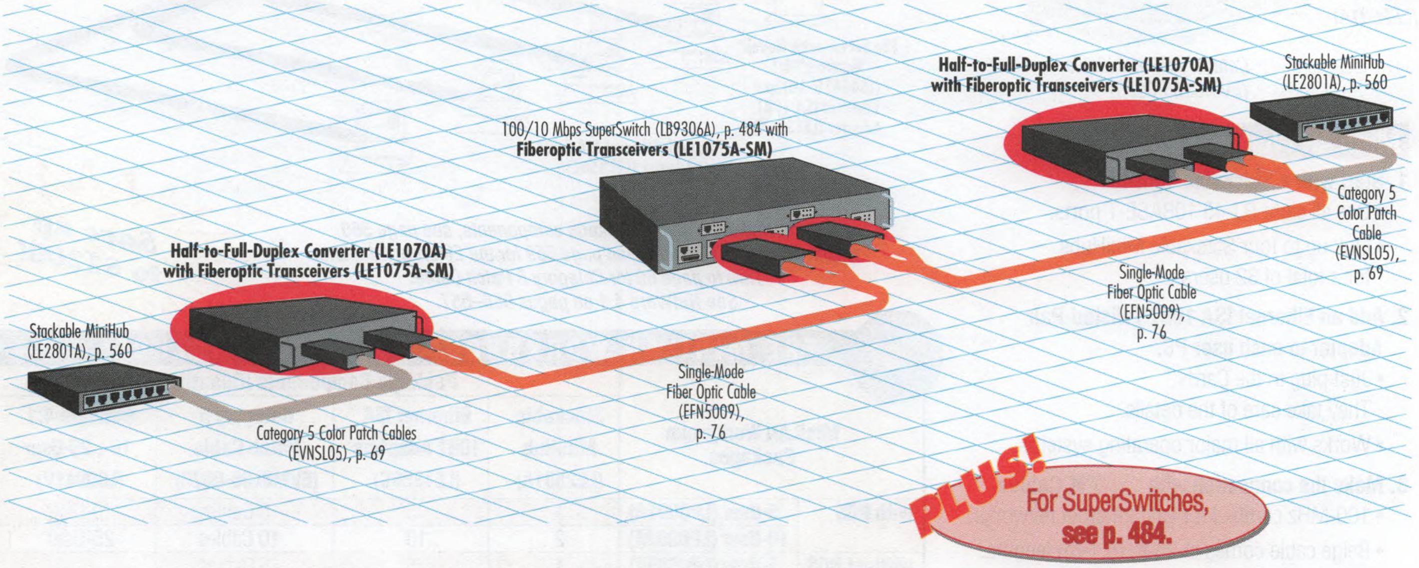
SIMPLE!

The new BLACK BOX® **Half-to-Full-Duplex Converter** provides the perfect solution. It transparently converts half-duplex Ethernet to full-duplex. By eliminating the Ethernet CSMA/CD distance limitation, it enables you to extend your LAN links far beyond the 2-km limit of fiber.

Simply select a central site for your SuperSwitch, and run fiberoptic cable to as many sites as necessary. Each site will need a Full-to-Half-Duplex Converter with a fiber transceiver attached.

Then select a transceiver based on the distance. For example, our Single-Mode Fiber Transceiver (LE1075A-SM) can go up to 15 km. And there you have it—instead of a buying a router and an expensive T1 link, you get the distance you need plus double the speed—a 20-Mbps bonus!

Just one more way Black Box brings you *real* solutions—every day.


Half-to-Full-Duplex Converter (LE1070A) with Fiberoptic Transceivers (LE1075A-SM)
Stackable MiniHub (LE2801A), p. 560
100/10 Mbps SuperSwitch (LB9306A), p. 484 with Fiberoptic Transceivers (LE1075A-SM)
Category 5 Color Patch Cable (EVNSL05), p. 69
Single-Mode Fiber Optic Cable (EFN5009), p. 76
Half-to-Full-Duplex Converter (LE1070A) with Fiberoptic Transceivers (LE1075A-SM)
Stackable MiniHub (LE2801A), p. 560
Single-Mode Fiber Optic Cable (EFN5009), p. 76
Category 5 Color Patch Cables (EVNSL05), p. 69

PLUS! For SuperSwitches, see p. 484.

Black Box Explains...

Shared Ethernet (CSMA/CD) and Full-Duplex Ethernet.

Full-Duplex Ethernet doubles the throughput of traditional half-duplex Ethernet by combining high-speed LAN switching with simultaneous transmit and receive capabilities over dedicated links.

Because Full-Duplex Ethernet uses two lines to send data in both directions at the same time, you get 20-Mbps transmission—twice the 10-Mbps speed of half-duplex Ethernet!

In addition, Full-Duplex Ethernet doesn't have the collision problems of half-duplex Ethernet, so you get better performance as well as high speed.

Standard Ethernet uses the CSMA/CD protocol to transfer data. Since a network can either transmit or receive data, a station wanting to transmit a packet first "listens" to the line to ensure that no other stations are transmitting on the same line. The station will transmit only if the line is free.

As on most Ethernet LANs, multiple stations are likely to attempt transmitting data at any given time. As the number of users increases, so, too, does the likelihood of simultaneous transmissions. Collisions occur when two or more stations transmit at the same time. Collisions destroy

Half-to-Full-Duplex Converter • Fiberoptic Transceivers

Eliminate Ethernet CSMA/CD Distance Limitations!

20-Mbps Operation!
POWER
RECEIVE
TRANSMIT
COLLISION
JABBER
LINK MONITOR
XMT
RCV
BLACK BOX
Multimode Transceiver
HALF DUPLEX
ACTIVITY
BLACK BOX (412) 746-5500
Half to Full Duplex Converter
FULL DUPLEX
POWER

Fiberoptic Transceivers (top) fit into the AUI ports of the Half-to-Full-Duplex Converter (bottom).

- **Doubles the top speed of your 10-Mbps Ethernet LAN.**
- **The perfect solution for high-traffic bottlenecks.**
- **Eliminates Ethernet collisions.**
- **Extends Ethernet segments beyond the 2.5-km maximum Ethernet transmission distance.**

Half-to-Full-Duplex Converter

This Converter transparently changes half-duplex Ethernet to full-duplex Ethernet. Because full-duplex traffic goes in both directions at once, you get twice the speed with no collisions. Near-zero port-to-port switching delays and buffered, on-the-fly forwarding mean you get the fastest data forwarding possible—with no fragmented packets. These converters are designed to work in pairs.

Before half-duplex Ethernet, the only way to send Ethernet transmissions over distances of more than 2.5 km was a WAN link requiring a router and a leased line. The fastest affordable WAN link is 1.544-Mbps T1, which isn't fast enough to handle 10-Mbps Ethernet speeds.

You should use the Converter with Fiberoptic Transceivers for either multimode or single-mode fiberoptic cable. The Half-to-Full-Duplex Converter is, of course, fully IEEE 802.3 compliant.

Fiberoptic Transceivers

These Transceivers plug right into the AUI port of our Half-to-Full-Duplex Converter to make the connection to fiberoptic cable.

The Transceivers come in multimode and single-mode models. The Multimode Fiberoptic Transceiver makes the connection across up to 2 kilometers of multimode fiber cable. With the Single-Mode Fiberoptic Transceiver, you can transmit data up to 15 kilometers over single-mode fiber cable.

The Transceivers operate in either normal half-duplex Ethernet or in full-duplex Ethernet for up to 20-Mbps point-to-point operation. Operation and SQE enable/disable are switch-selectable. And you can monitor data-transfer activity easily with just a glance at the six LED indicators.

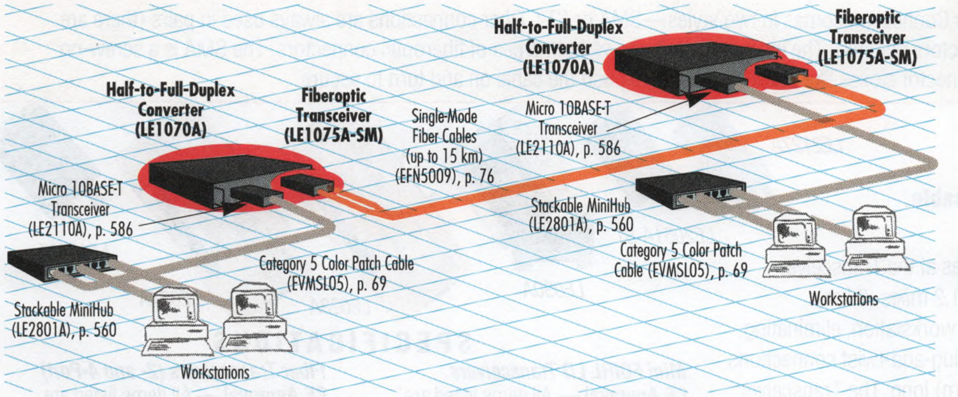
SPECIFICATIONS

Half-to-Full-Duplex Converter:

Speed — 14,880 pps in both directions
Standards — IEEE 802.3 10BASE5, FDSE (Full Duplex)
CE Approved — Yes
Connectors — (1) full-duplex AUI, (1) half-duplex AUI
Power — 115/230 VAC, 60/50 Hz, autosensing
Size — 1.8"H x 8.7"W x 7.8"D (4.6 x 22.1 x 19.8 cm)
Weight — 2 lb. (0.9 kg)

Fiberoptic Transceivers:

Standards — IEEE 802.3 10BASE5, FDSE (Full Duplex)
Connectors — (1) AUI, (2) ST® fiberoptic
Indicators — LEDs: Power, Receive, Transmit, Link, Collision, Jabber
Power — From the AUI interface
Size — 0.8"H x 1.7"W x 2.4"D (2 x 4.3 x 6 cm)


Half-to-Full-Duplex Converter (LE1070A)
Fiberoptic Transceiver (LE1075A-SM)
Single-Mode Fiber Cables (up to 15 km) (EFN5009), p. 76
Micro 10BASE-T Transceiver (LE2110A), p. 586
Half-to-Full-Duplex Converter (LE1070A)
Fiberoptic Transceiver (LE1075A-SM)
Micro 10BASE-T Transceiver (LE2110A), p. 586
Stackable MiniHub (LE2801A), p. 560
Category 5 Color Patch Cable (EVMSL05), p. 69
Workstations
Stackable MiniHub (LE2801A), p. 560
Category 5 Color Patch Cable (EVMSL05), p. 69
Workstations

FAXBACK INFORMATION
Request Document Number: 15303
Call 412-746-5500 Anytime

Item	Code	Price
Half-to-Full-Duplex Converter	LE1070A	**$1495.00**
Fiberoptic Transceivers		
Multimode	LE1075A	**$275.00**
Single-Mode	LE1075A-SM	**$600.00**
Category 5 Patch Cable (Beige) 10-ft. (3.0-m)	EVMSL05-0010	**$10.95**
For other lengths and colors, see p. 69.		
Single-Mode Duplex Fiber Optic Cable, PVC ST-ST	EFN5009	**$159.95 + $8.95/m**
For other connectors, see p. 76.		

remember to order cables

data and are an indicator that there's not enough shared bandwidth available to support the overall network demand. After every collision the network resets, forcing the relevant nodes to retransmit at a later time.

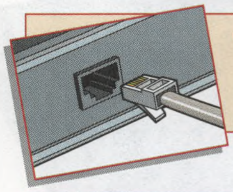
Half-Duplex Data Transmission—communication in either direction, but not both directions simultaneously—tends to operate at only about 40 to 60% of the potential 10 Mbps because of collisions. Network interface cards can accommodate collisions but at the expense of overall network speed.

Full-Duplex Ethernet, because it uses entirely different lines for Transmit and Receive, doesn't experience collisions and operates more efficiently. It can theoretically sustain a 100% network load at 20 Mbps. In practice, you can expect about a 20% increase in efficiency over half-duplex Ethernet, though a 60% increase is possible in heavily loaded environments.

Full Duplex is a point-to-point connection enabling two stations to send and receive data at the same time. A major benefit of Full-Duplex is that the only distance limitation is that of the attached transceiver.

For more information about this or any other LAN technology, call the Black Box Experts for FREE advice, any time you need it, 24 hours a day.

10BASE-T and Fiberoptic Transceivers



10BASE-T

Based on low-cost, unshielded twisted-pair cable and plug-in RJ-45 modular connectors, 10BASE-T is your simplest, most affordable option for implementing Ethernet or expanding your existing LAN.

CERTIFIED
READY PAK
ALL CABLES INCLUDED!
AVAILABLE!

10BASE-T Transceivers

LE2110A
LE2041A
LE056A
LE057A
LE3010A
LE3011A

- **Put your standard Ethernet workstation on 10BASE-T in seconds.**
- **Four types available. Choose the best one for your network.**

The 10BASE-T Micro Transceiver LD reports link failures at the Transceiver and hub. (Other transceivers only report the fault at the transceiver.)

The Mini 10BT Transceiver can be plugged directly into your workstation without extra cable. These tiny units are perfect for crowded installations.

Both the LE2110A and LE2041A are available in Ready Paks that come with one 10-ft. Category 5 Patch Cable (EVMSL05-0010).

The Mini 10BT Transceiver with Cable has the Cable already attached—6 inches (15.2 cm) of transceiver cable and 15 feet (4.6 m) of twisted pair. Choose the slide-lock or screw-lock AUI connector.

The 10BASE-T Transceivers connect two or four workstations to one cable.

Item	Code	Price
10BASE-T Micro Transceiver LD		
	LE2110A	**$109.00**
Ready Pak Includes: the Transceiver **plus (1)** 10-ft. Category 5 Cable		
	LE2110A-CABPAK	**$119.95**

Item	Code	Price
Mini 10BT Transceiver		
	LE2041A	**$49.00**
Ready Pak Includes: the Transceiver **plus (1)** 10-ft. Category 5 Cable		
	LE2041A-CABPAK	**$59.95**
Mini 10BT Transceiver with Cable		
Slide-Lock	LE3010A	**$125.00**
Screw-Lock	LE3011A	**$130.00**
10BASE-T Transceiver		
2-Port	LE056A	**$295.00**
4-Port	LE057A	**$395.00**

Remember to order cables. See our transceiver accessories (right).

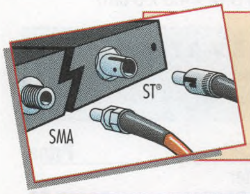
SPECIFICATIONS

10BASE-T Micro Transceiver LD
CE Approval — LE2110A
Connectors — (1) AUI male, (1) RJ-45 female
Indicators — LEDs: TX, RX, CD, status

Mini 10BT Transceiver
Connectors — (1) AUI male, (1) RJ-45 female
Indicators — LEDs: Power, TX, COL, JAB, SQE, RX/LNK, POL

Mini 10BT Transceiver with Cable
Connectors — (1) AUI male, (1) RJ-45 female
Indicators — LEDs: Power/TX, Link/RX, CD, Jabber

10BASE-T Transceivers (2- and 4-Port)
CE Approval — LE056A, LE057A
Connectors — Both: (1) RJ-45; LE056A: (2) AUI male; LE057A: (4) AUI male
Indicators — LEDs: Power/TX, Link/RX, CD, Jabber, SQE



Fiberoptic

The Fiber Transceiver Connection comes in two styles—SMA or ST®. Fiber connections are always used in pairs (there are always two fiber connectors per link). The inset at the **left** shows both types of fiberoptic connectors. The SMA is a screw-on connection; the ST connector closes like a BNC connector—push the cable on and turn to secure.

Fiberoptic Transceivers

LE2127A
LE2051A-ST
LE030A
LE023A
LE024A
LE1342A

- **Connect one, two, or four PCs to fiberoptic cable.**
- **Four models to choose from.**

Mini FOIRL LD Transceivers report all link failures at the Transceiver and at the hub. Build an EMI-resistant FOIRL up to 1.2 miles (2 km).

The Mini Fiber Transceiver plugs right into your workstation, eliminating the AUI cable. ST® connectors help you make fast plug-and-twist connections to a fiberoptic interrepeater link up to 1.2 miles (2 km) long. The Transceiver resists EMI, too.

The Fiber Optic Transceiver connects one PC to fiberoptic cable.

The 2- and 4-Port Fiber Transceivers connect two or four PCs to fiber.

The Micro Single-Mode Fiber Transceiver connects Ethernet directly to any single-mode or multimode 10BASE-FL/FOIRL network.

Item	Code	Price
Mini FOIRL LD Transceivers		
ST	LE2127A-ST	**$219.00**
SMA	LE2127A-SMA	**$249.00**
Mini Fiber Transceiver		
ST	LE2051A-ST	**$199.00**
Fiber Optic Transceivers		
ST	LE030A-ST	**$395.00**
SMA	LE030A-SMA	**$395.00**

Item	Code	Price
Fiber Transceivers		
2-Port		
ST	LE023A-ST	**$495.00**
SMA	LE023A	**$495.00**
4-Port		
ST	LE024A-ST	**$595.00**
SMA	LE024A	**$595.00**
Micro Single-Mode Fiber Transceiver		
	LE1342A	**$695.00**

Remember to order cables. See our transceiver accessories (right).

SPECIFICATIONS

Mini FOIRL LD Transceivers
CE Approval — All items listed are approved
Connectors — (1) AUI male, (2) ST or SMA
Indicators — LEDs: TX, RX, CD, Status

Mini Fiber Transceiver
Connectors — (1) AUI male, (2) ST
Indicators — LEDs: PWR, TX, COL, JAB, SQE, LNK, RX

Fiber Optic Transceivers
CE Approval — All items listed are approved
Connectors — (1) AUI male, (2) ST or SMA
Indicators — LEDs: Link, SQE

Fiber Transceivers (2- and 4-Port)
CE Approval — All items listed are approved
Connectors — Both: (2) ST or SMA; LE023A: (2) AUI male; LE024A: (4) AUI male
Indicators — LEDs: Power, TX, RX, CD, SQE, Link

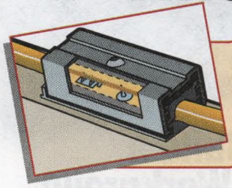
Micro Single-Mode Fiber Transceiver
CE Approval — All items listed are approved
Connectors — (2) ST® type connectors, (1) DB15 male with locking posts
Indicators — LEDs: JAB, Link, COL, RX, TX, Power

FAXBACK INFO
Request Document Number: 11330
Call 412-746-5500
Anytime

“Thick” and Thin Transceivers

remember to order cables Transceiver Cables see p. 78.

Standard (“Thick”) Coax



With the vampire tap you can connect a transceiver to standard coax cable without cutting the cable and installing connectors. When you tighten the tap over the cable, a pin pierces the cable’s jacket and makes the connection.

Thick Coax Transceivers

LE003A
LE008A
LE050A
LE052A
LE006A
LE063A
LE064A

The single-port Ethernet Transceiver connects one Ethernet device to coax. The 2- and 4-port models can connect more workstations with a single tap.

With the vampire tap, you can make your connection without having to install cable connectors. You need only a Coring Tool and an Allen Wrench (LN015) for installation. Replacement taps are available for future cabling needs. See Transceiver Accessories, **below.**

SPECIFICATIONS

Ethernet Transceivers
CE Approval — All items listed are approved
Connectors —
All, except LE008A: (1) Vampire tap;
LE003A: (1) AUI male;
LE008A: (1) AUI male;
LE050A: (2) AUI male;
LE052A: (4) AUI male
Indicators — LEDs: Power, SQE, Collision, Transmit, Receive

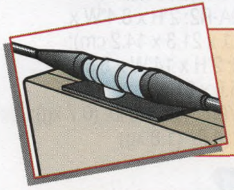
N-Series Transceivers
CE Approval — LE063A, LE064A
Connectors — All models: (1) N-Series;
LE006A: (1) AUI male;
LE063A: (2) AUI male;
LE064A: (4) AUI male
Indicators — LEDs: Power, SQE, Collision, Transmit, Receive

N-Series Transceivers are identical to the Ethernet Transceivers, but have N-Series connectors, which are screw-on connectors for standard coax cable.

Item	Code	Price
Ethernet Transceivers		
1-Port with AUI Monitor	LE003A	**$239.00**
1-Port with AUI Monitor without Tap	LE008A	**$200.00**
2-Port	LE050A	**$305.00**
4-Port	LE052A	**$425.00**
N-Series Transceivers		
1-Port with AUI Monitor	LE006A	**$255.00**
2-Port	LE063A	**$295.00**
4-Port	LE064A	**$395.00**

Remember to order cables. See our transceiver accessories (below).

Thin Coax



The BNC Tap, used with Thin Coax, has two female push-and-turn BNC connectors arranged in a T-style configuration. Also called an in-and-out connector, the T connector accepts terminated thin coax cable at both ends.

Thin Coax Transceivers

LE004A
LE051A
LE053A
LE2006A

Use the BNC Transceiver to connect one or more workstations with a single tap.

Use the Mini BNC Transceiver to connect the Ethernet AUI port on your PC directly to ThinNet cable—without transceiver cable. Its compact design makes it ideal for installation in tight corners.

This Transceiver is also available in a Ready Pak that comes with one 20-ft. ThinNet cable (LCN300-0020).

SPECIFICATIONS

BNC Transceivers
CE Approval — All items listed are approved
Connectors — All: (1) BNC T;
LE004A: (1) AUI male;
LE051A: (2) AUI male;
LE053A: (4) AUI male
Indicators — LEDs: Power, SQE, Collision, Transmit, Receive

Mini BNC Transceiver
Connectors — (1) AUI male, (1) BNC female
Indicators — (5) LEDs: Jabber, Collision, Receive, Transmit, Power

CERTIFIED READY PAK ALL CABLES INCLUDED! AVAILABLE!

Item	Code	Price
BNC Transceiver		
1-Port with AUI Monitor	LE004A	**$259.00**
2-Port	LE051A	**$305.00**
4-Port	LE053A	**$425.00**
Mini BNC Transceiver	LE2006A	**$49.00**
Ready Pak includes: the Transceiver **plus** (**1**) 20-ft. ThinNet Cable	LE2006A-CABPAK	**$69.95**

Remember to order cables. See our transceiver accessories (below).

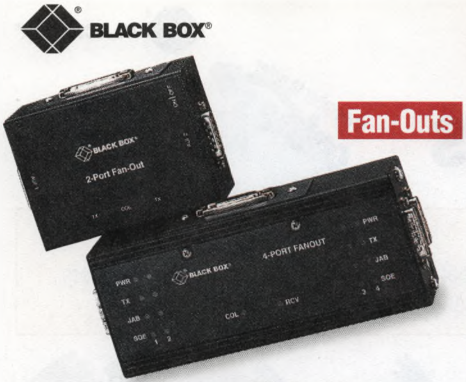
Transceiver Accessories

Use these accessories with all the Transceivers listed on this page except the Mini BNC (LE2006A).

CE Approval — LE005A

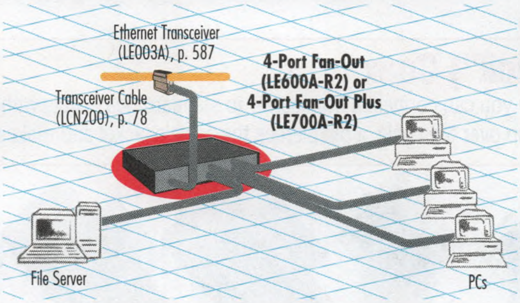
Item	Code	Price
Ⓐ AUI Monitor	LE005A	**$55.00**
Ⓑ Coring Tool and Allen Wrench	LN015	**$52.00**
Replacement Taps		
Ⓒ Low Profile Vampire Tap	LE011	**$44.95**
Ⓓ “N” Type “T” Tap	LE012	**$47.00**
Ⓔ BNC Type “T” Tap	LE013	**$43.00**
Ⓕ BNC Vertical Tap	LE014	**$31.95**
remember to order cables Transceiver Cable 10-ft. (3.0-m)	LCN200-0010	**$55.95**

For other lengths, see p. 78.



Fan-Outs

Add Workstations…


Ethernet Transceiver (LE003A), p. 587
Transceiver Cable (LCN200), p. 78
4-Port Fan-Out (LE600A-R2) or 4-Port Fan-Out Plus (LE700A-R2)
File Server
PCs

…to an Existing Ethernet Backbone…

- **Expand one AUI transceiver port into two or four ports.**
- **For use with external transceivers.**

Fan-Outs eliminate the need to install separate transceivers when you add workstations, servers, or printers so you can reduce cable and installation costs.

Installing transceivers too close together reduces network reliability. This can be a problem if you install more than one workstation in a small office. A Fan-Out solves that problem by replacing several individual transceivers.

These compact Fan-Outs draw power directly from the AUI interface so you don't have to worry about where the nearest outlet is. You can even install them above ceiling tiles along with the network transceivers.

2-Port Fan-Out

Ideal when you need to add only one additional workstation.

4-Port Fan-Out

Set up a small workgroup of up to four users on your Ethernet backbone.

SPECIFICATIONS

Standards — Ethernet Ver. 2, IEEE 802.3
CE Approval — All items listed are approved
Connectors — LE720A: (1) AUI 15-pin female, (2) AUI 15-pin male; LE600A-R2: (1) AUI 15-pin female, (4) AUI 15-pin male
Indicators — LE720A: Power, Transmit Data, Receive Data, Collision; LE600A-R2: Each port: Power and Transmit; Network: Collision, Receive
Power — From the AUI ports
Size — LE720A: 1.5"H x 6.3"W x 3"D (3.8 x 16 x 7.6 cm); LE600A-R2: 1.8"H x 6.8"W x 2.7"D (4.6 x 17.3 x 6.9 cm)
Weight — LE720A: 0.9 lb. (0.4 kg); LE600A-R2: 4 lb. (1.8 kg)

Item	Code	Price
Fan-Outs		
2-Port	LE720A	**$265.00**
4-Port	LE600A-R2	**$400.00**
To network your Fan-Out, order our…		
BNC Transceiver	LE004A	**$259.00**
Ethernet Transceiver	LE003A	**$239.00**

…or Build a Standalone Workgroup.

- **Expand 1 AUI transceiver port into 4 or 8 ports.**
- **Use them standalone to create a 4- or 8-station network.**
- **Or connect them directly to a transceiver.**

4-Port Fan-Out Plus

Set up a free-standing workgroup consisting of up to four workstations. The plus: added fault-tolerance. If one DTE falls into a continuous-transmission mode, it's the only one affected. The other ports continue with normal operation. Four DIP switches let you set the Signal Quality Error (SQE) test at ON or OFF for each individual DTE port.

8-Port Fan-Out

Connect up to eight Ethernet devices to your network with just one tap. Or set up a standalone network. Just plug eight workstations into our Fan-Out whenever you need to create a workgroup in a hurry.

SPECIFICATIONS

Standards — Ethernet Ver. 2, IEEE 802.3
CE Approval — All items listed are approved
Connectors — LE700A-R2: (1) DB15 AUI female, (4) DB15 DTE male; LE780A-R2: (1) AUI 15-pin female, (8) AUI 15-pin male
Indicators — LEDs: Collision, RX; Each port: TX, Jabber, Power
Power — LE700A-R2: From DTE interface, 10 to 16 VAC, 150 mA; LE780A-R2: From DTE interface, 10 to 16 VAC, 200 mA
Size — LE700A-R2: 2"H x 8.4"W x 5.6"D (5.1 x 21.3 x 14.2 cm); LE780A-R2: 2"H x 14"W x 8.5"D (5.1 x 35.6 x 21.6 cm)
Weight — LE700A-R2: 1.5 lb. (0.7 kg); LE780A-R2: 4 lb. (1.8 kg)

remember to order cables
Ethernet Cables, see p. 78.

FAXBACK INFO
Request Document Number: 11299
Call 412-746-5500
Anytime

Item	Code	Price
Fan-Outs		
4-Port Plus	LE700A-R2	**$455.00**
8-Port	LE780A-R2	**$895.00**

remember to order cables
Ethernet Transceiver Cable, PVC, 10-ft. (3.0-m) LCN200-0010 **$55.95**
For other lengths and pinnings, see p. 78.

* * *

The compact Direct Connect weighs less than a pound—perfect for traveling demos.

Direct Connect

Build a Mini Ethernet LAN without Using Any Backbone Cable!

SPECIFICATIONS

Standards — Ethernet Ver. 2, IEEE 802.3
CE Approval — All items listed are approved
Connectors — LE054A: (2) AUI 15-pin male; LE055A: (4) AUI 15-pin male
Indicators — Power, TX, RX, CD, SQE
Power — From the AUI ports
Size — 3"H x 6.3"W x 1.5"D (7.6 x 16 x 3.8 cm)

- **Plug in servers or workstations directly for a no-backbone network.**

Use the Direct Connect from Black Box to build a small Ethernet Network of two or four devices without actually installing any backbone cable. If all of your devices have a DB15 female AUI port, simply connect transceiver cables between the devices and the Direct Connect. That's all—you've got your Ethernet!

Item	Code	Price
Direct Connect		
2-Port	LE054A	**$235.00**
4-Port	LE055A	**$385.00**

remember to order cables
Ethernet Transceiver Cable, PVC, 10-ft. (3.0-m) LCN200-0010 **$55.95**
For plenum applications or other lengths, see p. 78

Single-Pair Ethernet Networking

Solve Network Distance Problems. Extend Any Ethernet LAN 1500 Feet via Low-Cost Voice-Grade UTP Cable.

- **Connect multiple LANs in separate buildings—over existing phone lines.**
- **Noise-rejection technology enhances throughput.**
- **Works with any 10BASE-T, 10BASE2, or 10BASE5 network.**
- **Full 10-Mbps performance.**

Jabber
Link Test
Activity
Power
Collision
BLACK BOX®
XL600+
Single UTP
10 BaseT
Power
BLACK BOX®
LD
LD Repeater

Link Ethernet devices in two separate buildings over ordinary phone lines, thanks to Black Box.

Think of the installation problems that are suddenly easy to solve. Think of the savings. With Single-Pair Ethernet you eliminate the biggest cost in any network—the recabling—and you can set up your LAN when recabling is impossible.

Install a network in an old building.

When you can't recable, or recabling would be too expensive, the Single-Pair Ethernet solution can save you enormous amounts of time and thousands of dollars in installation costs.

Integrate it into your existing network.

Single-Pair Ethernet can be used along with 10BASE-T, standard Ethernet, and Thin Ethernet networks. That means you can integrate it easily into your existing Ethernet network via AUI or Thin Ethernet connections.

10BASE-T Extender

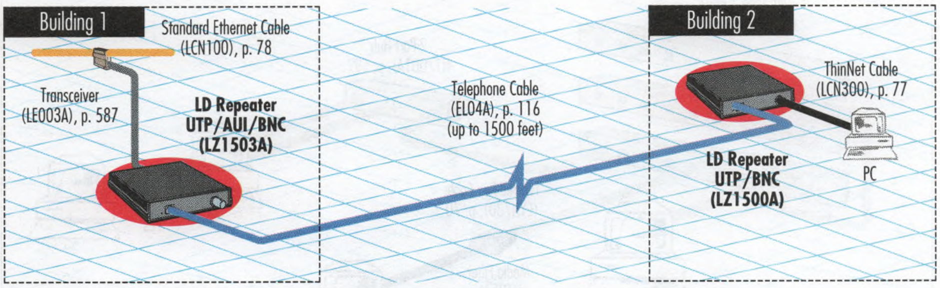
The XL600+ Long Distance Repeater (LZ6000A-R2) extends the 328-foot (100-m) limit of 10BASE-T, giving you up to 1250 feet (380 m) between two units over one pair of existing phone wires. Now it's easy and inexpensive to connect remote nodes and hubs to your 10BASE-T network.

Local (10BASE2) Repeaters

The Thin Repeater (LZ1202A, LZ1204, LZ1208A-R2) is an inexpensive ThinNet Repeater used to extend and segment 10BASE2 networks. It features autopartitioning and rejection circuitry to reduce noise. You can use it to link up with an existing ThinNet LAN.

Long Distance Repeaters

Choose an LD (Long-Distance) Repeater (LZ1500A, LZ1502A–LZ1504A) if you want a full 1500 feet (460 m) over a single pair of phone wires (you can access them in the wiring closet at each network location). New noise-rejection technology prevents interference from fluorescent lights and other electronic equipment.


Building 1
Standard Ethernet Cable (LCN100), p. 78
Transceiver (LE003A), p. 587
LD Repeater UTP/AUI/BNC (LZ1503A)
Telephone Cable (EL04A), p. 116 (up to 1500 feet)
Building 2
ThinNet Cable (LCN300), p. 77
LD Repeater UTP/BNC (LZ1500A)
PC

SPECIFICATIONS

Speed — 10 Mbps
Standards — IEEE 802.3 Ethernet
CE Approval — 230–VAC versions: LZ1202AE, LZ1204AE-R2, LZ1208AE-R2, LZ1500AE
Connectors — All: (1) 5-pin DIN;
LZ6000A-R2: (2) RJ-45;
LZ1202A: (2) BNC;
LZ1204A-R2: (4) BNC, (1) DB15 AUI;
LZ1208A-R2: (8) BNC, (1) DB15 AUI;
LZ1500A: (1) RJ-11, (1) BNC;
LZ1502A: (2) RJ-11, (2) BNC;
LZ1503A: (1) RJ-11, (1) BNC, (1) 15-pin AUI;
LZ1504A: (4) RJ-11, (4) BNC, (1) 15-pin AUI
Indicators — LZ6000A-R2: Power, Activity, Link, Test, Jabber, Collision;
All others: LEDs: Link Status:
LZ1202A, LZ1500A: (2);
LZ1503A: (3);
LZ1204A-R2, LZ1502A: (4);
LZ1208A-R2: (8);
LZ1504A: (9)
Power — 115/230 VAC, 60/50 Hz, wallmount
Size — LZ6000A-R2: 0.8"H x 2.7"W x 4.5"D (2 x 6.9 x 11.4 cm);
LZ1202A: 1.5"H x 4"W x 9.5"D (3.8 x 10.2 x 24.1 cm);
LZ1204A-R2, LZ1500A, LZ1502A: 1.5"H x 6.2"W x 9.5"D (3.8 x 15.7 x 24.1 cm);
LZ1208A-R2: 1.7"H x 2"W x 12.3"D (4.3 x 5.1 x 31.2 cm);
LZ1503A, LZ1504A: 1.7"H x 9"W x 12.3"D (4.3 x 22.9 x 31.2 cm)
Weight — LZ6000A-R2: 3 lb. (1.4 kg);
LZ1202A, LZ1204A-R2, LZ1500A, LZ1502A, LZ1503A: 5 lb. (2.3 kg);
LZ1208A-R2, LZ1504A: 7 lb. (3.2 kg)

No More Trenching between Buildings!

Link two buildings 1500 feet (460 m) apart with one pair of ordinary telephone wires you've already buried in the ground or in the walls. There's no need for trenching and you get 10-Mbps speed. Installs in just minutes!

Item	Code	Price
10BASE-T Extender		
XL600+ LD (UTP/10BASE-T)	LZ6000A-R2	**$599.00**
Local Repeaters		
Thin Repeater		
2-Port	LZ1202A	**$229.00**
4-Port	LZ1204A-R2	**$339.00**
8-Port	LZ1208A-R2	**$599.00**
Long-Distance Repeaters		
LD Repeaters		
UTP/BNC	LZ1500A	**$1189.00**
UTP/(2)BNC	LZ1502A	**$1699.00**
UTP/BNC/AUI	LZ1503A	**$1269.00**
UTP/(4)BNC/AUI	LZ1504A	**$3389.00**
remember to order cables		
Standard Ethernet Backbone Coax Cable, 384-ft. (117.0-m)	LCN100-0384	**$469.95**
For other lengths, see p. 78.		
ThinNet Cable, 10-ft. (3.0-m)	LCN300-0010	**$17.95**
For other lengths, see p. 77.		
Bulk Telephone Cable, 1000-ft. (304-m)	EL04A-10	**$84.95**
For other lengths, see p. 116.		

Token Ring: Fault-Tolerant, Predictable,

Black Box Explains...

Networking with Token Ring.

It's a sophisticated LAN technology that's endorsed by IBM® and defined by the IEEE 802.5 standard.

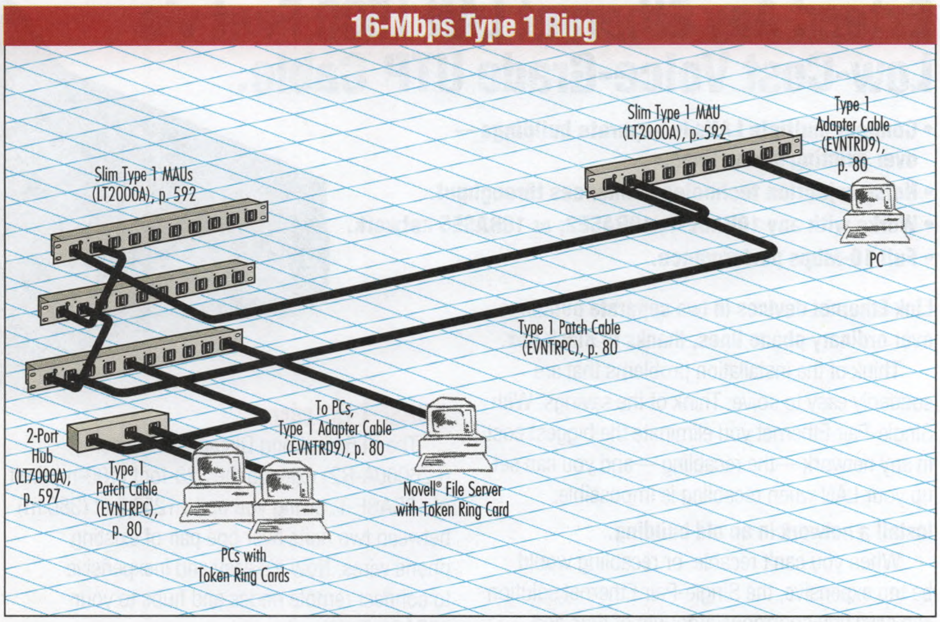
Token Ring uses a star-wired topology in which all workstations connect to a central Multistation Access Unit (MAU). This makes moving, changing, and adding equipment quick and easy.

Token Ring is fault-tolerant. If, for example, the cable to one of your networked PCs is damaged or cut, the MAU automatically bypasses that port. Because the logical ring stays intact, your network stays up.

Token Ring is easy to connect to a mainframe. You can plug your network directly into into an IBM AS/400® or 3174 controller. (Added workstation software or a gateway may be necessary.)

Token Ring supports high speeds—up to 16 Mbps. And you can connect up to 72 devices using low-cost unshielded twisted-pair cable (Category 3, 4, or 5), or up to 260 devices using shielded twisted-pair cable.

16-Mbps Type 1 Ring


Slim Type 1 MAU
(LT2000A), p. 592
Type 1
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(LT2000A), p. 592
PC
Type 1 Patch Cable
(EVNTRPC), p. 80
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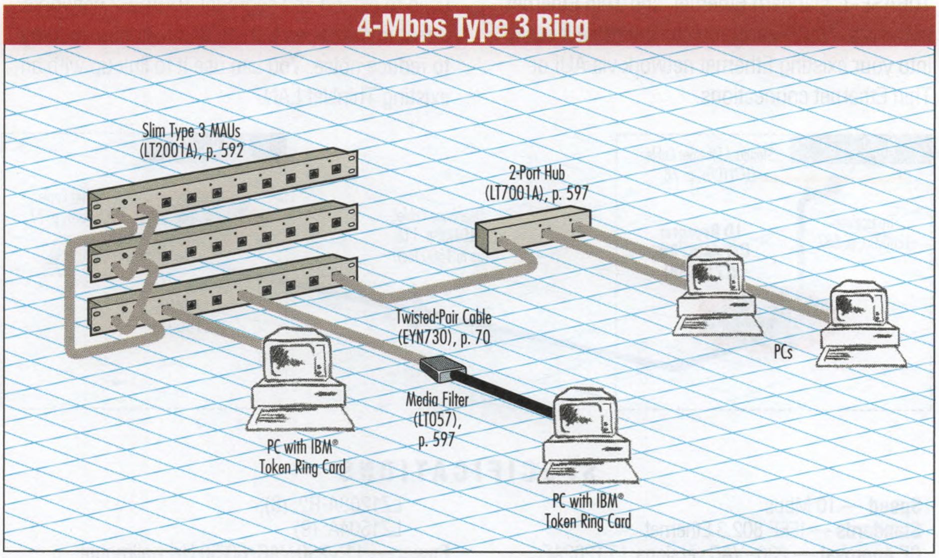
Novell® File Server
with Token Ring Card
PCs with
Token Ring Cards

4-Mbps Type 3 Ring


Slim Type 3 MAUs
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(LT7001A), p. 597
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(LT057),
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PC with IBM®
Token Ring Card
PC with IBM®
Token Ring Card

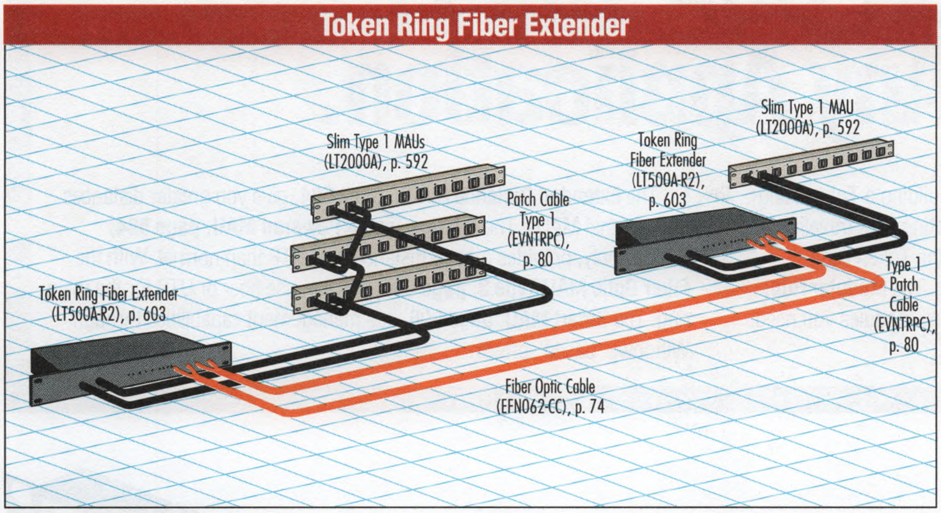
remember to order cables

Token Ring Cables, see pp. 80–81.

TOKEN RING

Perfect for IBM Mainframe Environments.

Token Ring Fiber Extender


Slim Type 1 MAUs
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The Intel TokenExpress LAN Adapters You Want! (Our Techs Like Them, Too.)

TECH SUPPORT'S PRODUCT OF CHOICE

Get Support for Any Network Operating System—in One Step!

intel
Intel TokenExpress PRO
LAN Adapter with Flash
Intel TokenExpress PRO
LAN Adapter with Flash
The powerful LAN connection for Intel486
and Pentium processor-based client PCs.
Includes... Works for:
Simple one-step switchless installation
Fast, centralized driver update
Built-in virus protection
intel

ABSOLUTELY GUARANTEED FOR LIFE

We asked the Black Box Technical Experts why they chose the Intel® TokenExpress™ LAN Adapters as Tech Support's Product of Choice. They said, "We never have to answer any questions about them—you just plug them in and they work perfectly. Nothing goes wrong; nothing's complicated. Period."

You'll appreciate these LAN Adapters because they work in all IBM® environments and support just about every network operating system. They're also guaranteed for life so you're covered if anything should go wrong.

Best of all, installation is a snap: Just plug 'em in and you're ready to go. That's it. And if you do have a question, you can count on our Technical Support Staff—24 hours a day, seven days a week—to give you a hand.

MORE! About the Intel® TokenExpress™ LAN Adapters, see p. 600.

Black Box Explains...

The Most Common Token Ring Questions.

What Are MAUs?

MAUs (Multistation Access Units) are wiring concentrators (also called hubs) used in a Token Ring LAN.

What Are Repeaters?

Use repeaters to increase either main-ring or lobe lengths in a Token Ring LAN. The main-ring length is the distance between MAUs. The lobe length is the distance from MAU to workstation. You can extend your Token Ring network up to 1.5 miles (2.4 km) using fiberoptic repeaters and cable.

How Does Type 1 Differ from Type 3?

Type 1 Token Ring networks use Type 1 Token Ring cable (shielded twisted pair) with IBM® style universal data connectors, which provides greater distances with passive devices. Type 1 also supports greater speeds (16 Mbps), with fewer problems on the network.

Type 3 Token Ring networks use Category 3, 4, or 5 unshielded twisted-pair cable with plug-in modular connectors. Type 3 cabling is much more flexible. It's generally already installed in most buildings. But since the cable isn't shielded, you get less distance and more network problems.

Both Type 1 and Type 3 networks can operate at 4 or 16 Mbps.

BLACK BOX® MAUs—for Any Application.

A MAU is absolutely necessary when you're building a Token Ring network. It acts as an "electronic traffic cop" directing data traveling from any workstation, printer, file server, etc., to the Token Ring.

The **Slim MAU, below,** is great for tight spaces. The **Modular Hub, page 593,** is a chassis which enables you to add any modules you need.

The **Extended Distance MAUs, page 594,** give you greater distances than normal MAUs. The **4-Mbps Type 3 Powered MAU, page 594,** 4 Mbps only, provides greater distance over UTP than normal. With the **Fiber Optic MAU Type 3, page 594,** you can use fiber or UTP for the main ring. The **Smart MAU, page 596,** has management capabilities through Windows® based software.

Slim MAUs

Getting a Little Tight in the Wiring Closet? This Slim MAU Will Fit.

RING IN
RESET
RING OUT
BLACK BOX (412) 746-5500
16 Port Slim Type 1 MAU

Just 1 inch (2.5 cm) wide!
And no relay tool needed.
Just press Reset.

- **Compact size.**
- **Totally compatible with the IBM 8228 MAU.**
- **Choose for Type 1 or Type 3.**
- **Easy installation.**

When you install your Token Ring network, your MAU of choice is the Slim MAU. It can support up to 8 or 16 workstations with all the important features you need—at a great price.

The Slim MAU is under 2 inches (5 cm) tall and just 1 inch (2.5 cm) deep. This compact, lightweight MAU is easier to handle than other larger MAUs. The 16-Port Slim Type 1 MAU is just over 3 inches tall, and it supports up to 16 workstations at 4 or 16 Mbps. It provides the same performance as the IBM® 8228 MAU—and total compatibility.

All Slim MAUs fit neatly into a standard 19-inch rack. They're nonpowered, so you don't need a power connection. And the Ring-In and Ring-Out are adjacent for simplified cable management.

SPECIFICATIONS

Relay Tool Required? — No

Speed — 4 or 16 Mbps

CE Approval — All items listed are approved

Connectors — LT2000A: (8) Data Connectors, (1) Ring-In, (1) Ring-Out;
LT2001A: (8) RJ-45 Unshielded, (1) Ring-In, (1) Ring-Out;
LT2002A: (8) RJ-45 Shielded, (1) Ring-In, (1) Ring-Out;
LT2050A: (16) Data Connector, (1) Ring-In, (1) Ring-Out

Indicators — LEDs: LT2000A–LT2002A: (8) Port Status, (1) Reset;
LT2050A: (16) Port Status, (1) Reset

Power — Nonpowered

Size — LT2000A–LT2002A: 1.8"H x 19"W x 1"D (4.5 x 48.3 x 2.5 cm);
LT2050A: 3.4"H x 19"W x 1"D (8.6 x 48.3 x 2.5 cm)

Weight — LT2000A–LT2002A: 2.2 lb. (1 kg);
LT2050A: 3.7 lb. (1.7 kg)

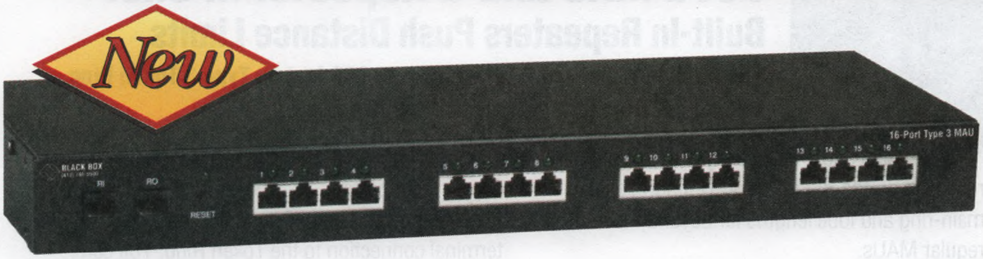
FAXBACK INFORMATION
Request Document Number: 12812
Call 412-746-5500 Anytime

Item	Code	Price
Slim MAUs		
8-Port Type 1	LT2000A	**$395.00**
Type 3		
Unshielded	LT2001A	**$385.00**
Shielded	LT2002A	**$450.00**
16-Port Type 1	LT2050A	**$750.00**
New Type 3		**See page 593.**

remember to order cables *For Data Connectors and our complete line of Token Ring Cables, see pages 80–81.*

16-Port Type 3 MAU

This 16-Port MAU Requires No AC Power Outlet.



- **16 ports in a chassis only 1 RU high.**
- **No AC power required.**
- **Port reset button.**

This nonpowered MAU packs 16 RJ-45 Token Ring ports into a slim case only one rack unit high.

It's loaded with features, too. Port status LEDs display status activity of each port. Lobe ports feature shielded RJ-45 connectors, enabling you to use 100-ohm shielded twisted-pair cable if you require greater distances.

Ports are automatically wrapped if a cable is unplugged, keeping the network up and undisturbed.

A battery-powered port reset button enables you to reset ports by simply pressing a button—no reset tool needed.

- **Status LEDs on all lobe ports.**
- **Autowrap ring-in and ring-out ports.**
- **Shielded RJ-45 lobe connectors.**

SPECIFICATIONS

Relay Tool Required — None
Speed — 4 or 16 Mbps
CE Approval — All items listed are approved
Connectors — (16) RJ-45 Shielded, (1) Ring-In, (1) Ring-Out
Indicators — LEDs (16) Port Status, (1) Reset
Power — Nonpowered; reset button powered by lithium battery (included)
Size — 1.7"H x 17.2"W x 6"D (4.3 x 43.7 x 15.2 cm)
Weight — 3.5 lb. (1.6kg)

MORE! MAUs, see p. 592–596.

FAXBACK INFORMATION
Request Document Number: 12812
Call 412-746-5500 Anytime

Item	Code	Price
16-Port Type 3 MAU	LT2060A	**$700.00**
remember to order cables: Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned PVC	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

◆ ◆ ◆

Modular Hub

Build the Token Ring System You Want with Hot-Swappable Modules.

- **Customize your Token Ring MAU or Repeater.**
- **Change modules while your LAN is up.**
- **Compact rackmountable design.**
- **Set the speed of each Repeater independently.**

House multiple MAUs and Repeaters in a single low-profile chassis. Start with our LT800A Chassis, and fill it with up to four MAU Modules, Repeater Modules, or a combination of both. Ring-In/Ring-Out Modules are available, too.

MAU-8 Module

Plug in four Type 3 MAU-8 Modules to get connections for a total of 32 stations. When you need more ports, just add another chassis. The Modular Hub can be cascaded.

Repeater Modules

Use the Repeaters to extend the main ring distance. Extend a single lobe to a distant workstation with one Repeater. At 16 Mbps, you can get 1000 feet (305 m) between Repeaters over Type 1, and at 4 Mbps, 2400 feet (730 m).

Or extend the distance from the MAU to a single station. At 16 Mbps, maximum lobe length over Type 3 cable is 420 feet (130 m); at 4 Mbps, it's 1000 feet (305 m).

Ring-In/Ring-Out Modules

Use Ring-In/Ring-Out Modules to daisychain Modular Hubs, or connect a Modular Hub to another MAU.

SPECIFICATIONS

Speed — 16 and 4 Mbps
CE Approval — All items listed are approved
Connectors — LT800A: None;
LT803: (8) RJ-45;
LT811, LT821: (2) Data Connectors;
LT813, LT823: (2) RJ-45
Indicators — LEDs: LT800A: Power;
LT803: (8) Active station;
LT811, LT813: (1) Each for Data, Station, Ring-In Loopback, Ring-Out Loopback;
LT821, LT823: None
Power — LT800A: 115 VAC, 60 Hz, 25 watts, when fully populated
Size — LT800A: 1.7"H x 17.2"W x 8"D (4.3 x 43.7 x 20.3 cm)
Weight — LT800A: 5 lb. (2.3 kg) when fully populated

BLACK BOX
LT800A

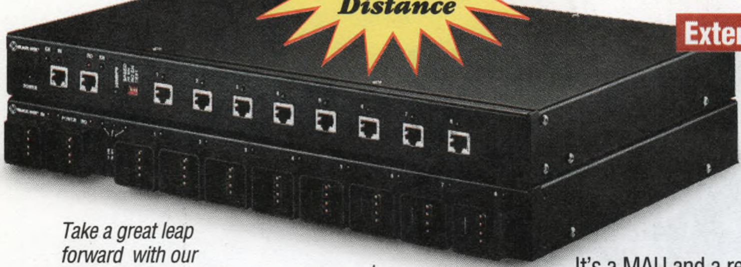
When you need a MAU or a Repeater, just plug in the module. Changing configuration is every bit as easy! The modules (inset photo above, shown left to right): Type 3 MAU-8, Type 1 Repeater, Type 3 Repeater, Type 1 RI/RO, Type 3 RI/RO.

Item		Code	Price
First order the Chassis…			
Modular Hub Chassis		LT800A	**$295.00**
. . . Then order the Modules you need:			
MAU-8	Type 3	LT803	**$345.00**
Repeater	Type 1	LT811	**$1145.00**
	Type 3	LT813	**$1145.00**
RI/RO	Type 1	LT821	**$105.00**
	Type 3	LT823	**$95.00**
Modular Hub Blank Faceplate		LT850	**$10.00**
remember to order cables: Category 5 Solid Conductor Cable, 4-Pair10-ft. (3.0-m), Straight-Pinned PVC		EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

FAXBACK INFORMATION
For Extended Distance MAUs: 16641
For Type 3 Powered MAUs: 16658
For Fiber Optic MAU Type 3: 16665
Call 412-746-5500 Anytime

4/16 Mbps Extended Distance



Take a great leap forward with our Extended Distance MAUs—for Type 3 (top) and Type 1 (bottom) installations.

POWERED

Extended Distance MAUs

Get a MAU *and* a Repeater in One!

Built-In Repeaters Push Distance Limits.

- **Go 1500 feet on Type 1 Token Ring, or 900 feet on Type 3 Token Ring.**
- **Handy LEDs monitor activity and spot trouble.**

It's a MAU and a repeater in one. The built-in repeaters on the Ring-In/Ring-Out ports extend main-ring and lobe lengths far beyond those of regular MAUs.

Typical Token Ring specs set lobe length, the distance from the MAU to the workstation, at 328 feet (100 m).

But with our Extended Distance MAUs, you can get a maximum lobe length of 900 feet (274 m) at 16 Mbps over Type 3 Category 4 cable. And at 16 Mbps over Type 1 cable you can get almost five times the standard: an incredible 1500 feet (457 m). You get that extra distance because these are powered MAUs.

The Type 1 Extended Distance MAU is fully compatible with the IBM® 8228, and runs at 16 or 4 Mbps. Both the Type 1 and Type 3 supply eight ports.

Each port has an LED to indicate active terminal connection to the Token Ring. You can detect faulty lobe connections at a glance—without having to plug and unplug workstations. Troubleshooting's easier, and you keep downtime to a minimum.

SPECIFICATIONS

Relay Tool Required — No
Speed — 16/4 Mbps
CE Approval — All items listed are approved
Connectors — (8) Station, (1) Ring-In, (1) Ring-Out;
LT1051A: RJ-45 female;
LT1042A: Data connector female
Indicators — LEDs: (1) Power, (2) Loopback Enable, (1) Ring-In, (1) Ring-Out, (1) Data Rate, (8) Lobe port
Power — 100–240 VAC, 60-50 Hz, Autosensing
Size — 1.7"H x 17.2"W x 10.6"D (4.3 x 43.7 x 26.9 cm)
Weight — 6 lb. (2.7 kg)

Item	Code	Price
Extended Distance MAUs		
Type 3	LT1051A	**$1995.00**
Type 1	LT1042A	**$1995.00**
remember to order cables Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned, PVC	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

Type 3 Powered MAUs

Build an Economical Long-Distance 4-Mbps Network.

- **Get up to 1000 feet (304 m) of distance.**
- **Use inexpensive Category 3 twisted-pair cable.**
- **Fully compatible with the IBM 8228 MAU.**
- **Exclusively for networks that operate at 4 Mbps.**

4 Mbps Extended Distance

POWERED
BLACK BOX
8-PORT TYPE 3 MAU
POWER
RI
RO
1
2
3
4
5
6
7
8

With Type 3 Powered MAUs, you get the extra distance you need. Power provides the boost the signal needs to reach distances up to 1000 feet.

SPECIFICATIONS

Relay Tool Required — No
Speed — 4 Mbps
Connectors — LT054A: (6) RJ-45 female: (4) Station, (1) Ring-In, (1) Ring-Out;
LT058A: (10) RJ-45 female: (8) Station, (1) Ring-In, (1) Ring-Out
Indicators — LT054A: (4) Port status, (1) Power;
LT058A: (8) Port status, (1) Power
Power — 115 or 220 VAC (switch-selectable), 6 watts
Size — LT054A: 1.7"H x 11.3"W x 4.9"D (4.3 x 28.7 x 12.4 cm);
LT058A: 1.7"H x 16.2"W x 4.9"D (4.3 x 41.1 x 12.4 cm)
Weight — LT054A: 2.4 lb.(1 kg);
LT058A: 3 lb. (1.4 kg)

Item	Code	Price
Type 3 Powered MAUs		
4-Port	LT054A	**$610.00**
8-Port	LT058A	**$815.00**
To connect a Token Ring Card with a DB9 connector, order our:		
16/4 Meg Media Filter	LT056A	**$49.95**
remember to order cables Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned, PVC	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

Fiber Optic MAU Type 3

Extend Your Token Ring to Another Building—with Fiber.

- Extend your main ring 3300 feet (1 km).
- Runs on both copper and fiber cable, with Ring-In and Ring-Out ports for both.
- Designed to work in pairs.
- Operates at 16 or 4 Mbps.
- Automatic loopback for added fault-tolerance.

BLACK BOX
POWER

Type 3 with Fiber Main Ring Option

SPECIFICATIONS

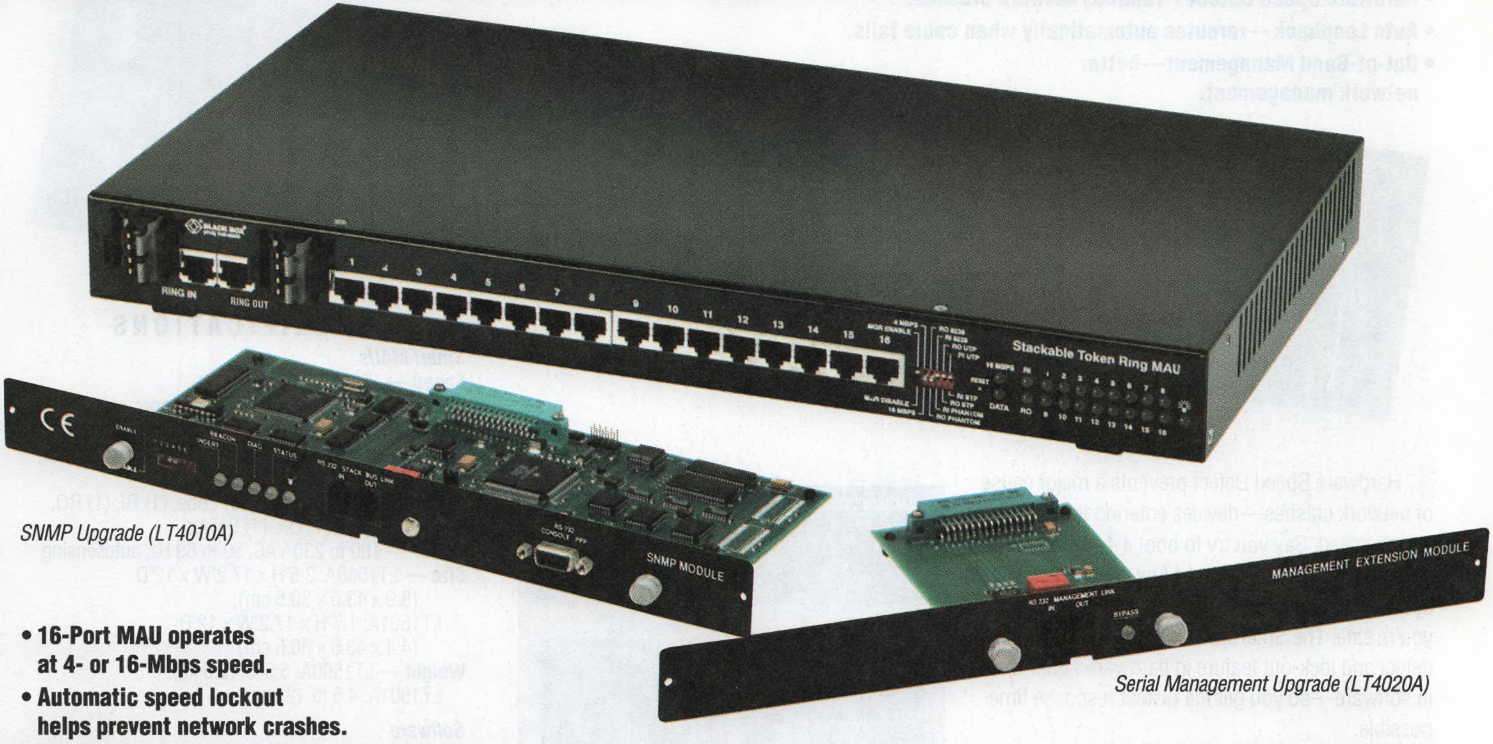
Relay Tool Required? — No
Speed — 16/4 Mbps
CE Approval — 230-VAC version: LT229AE
Connectors — (10) RJ-45 female: (8) Station, (2) Copper Ring-In, Ring-Out; also (2) ST® for optional fiber Ring-In, Ring-Out
Indicators — (8) Port, (2) Data, (2) Loop
Power — 115 VAC, 6 watts
Size — 1.7"H x 17.2"W x 6"D (4.3 x 43.7 x 15.2 cm)
Weight — 3.5 lb. (1.6 kg)

Item	Code	Price
Fiber Optic MAU Type 3	LT229A	**$1635.00**
remember to order cables Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned, PVC	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		
Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific lengths or bulk cable, see pp. 74 and 118.

Stackable Token Ring MAU

Get the Distance You Need—and the Management Options You Want.



SNMP Upgrade (LT4010A)

Serial Management Upgrade (LT4020A)

- **16-Port MAU operates at 4- or 16-Mbps speed.**
- **Automatic speed lockout helps prevent network crashes.**
- **Automatic loopback reroutes data if cable breaks occur.**
- **SNMP or serial management options provide in-band or out-of-band control.**
- **Retimes and regenerates signals to eliminate jitter on every port.**
- **Stack up to 16 MAUs for up to 256 users.**

Now you don't need to worry about going the distance on your Token Ring network—the Stackable Token Ring MAU takes care of it for you. You can operate at 4- or 16-Mbps speeds. And you have the option of installing SNMP or serial management upgrades for total control of all connected users.

Stack up to 16 MAUs and connect up to 256 users on your network. You can also mount this MAU in a standard 19-inch rack. The MAU retimes and regenerates the Token Ring signal on every port—including Ring In and Ring Out—allowing for maximum cable length and eliminating jitter. And it's fully compatible with the IEEE 802.5 Token Ring Standard.

Every feature attributed to one MAU applies to any and all stacked MAUs. Automatic speed lockout helps prevent a major cause of network crashes—beaconing due to incorrect speed. So you can be sure devices entering the ring at the wrong speed are immediately detected and isolated. Automatic loopback on Ring In/RIng Out ports detects breaks in the main cable ring and redirects the port to a backup path—without downtime. And Ring In/Ring Out connections are provided for STP and UTP connections.

If you need to control your MAUs, simply install one of two easy-to-install, user-upgradable network-management options. Both include the necessary software—and both provide support for up to 16 stacked hubs from one PC.

Use the SNMP option for on-site upgrades with the power of hub management. Select the Serial Management upgrade to extend SNMP management to other hubs. Or you can use it for out-of-band management.

SPECIFICATIONS

Data Rate — 4 or 16 Mbps
Protocol — IEEE 802.5 Token Ring
CE Approval — LT4000A
Connectors — (2) RJ-45 and (2) MIC for Ring In/Ring Out; (16) RJ-45 Lobe Ports
Indicators — LEDs: (16) Multistate Port Status; (1) Data Integrity; (1) Speed; (2) Ring In/Ring Out Cable Integrity; (1) Power
Power — 90 watts, 115–230 VAC, universal autosensing power supply
Size — 1.8"H x 17.5"W x 10"D (4.5 x 45 x 25.4 cm)
Weight — 8 lb. (3.6 kg)

FAXBACK INFORMATION
Request Document Number: 17343
Call 412-746-5500 Anytime

Item	Code	Price
Stackable Token Ring MAU	LT4000A	**$1695.00**
SNMP Upgrade	LT4010A	**$899.00**
Serial Management Upgrade	LT4020A	**$299.00**

You may also need...

Token Ring Media Filters	**See page 597.**
Token Ring Repeaters	**See pages 602–603.**
Category 5 Solid Conductor Cable, 4-Pair, 10-ft. (3.0-m), Straight-Pinned, PVC EYN737MS-0010	**$10.95**

remember to order cables

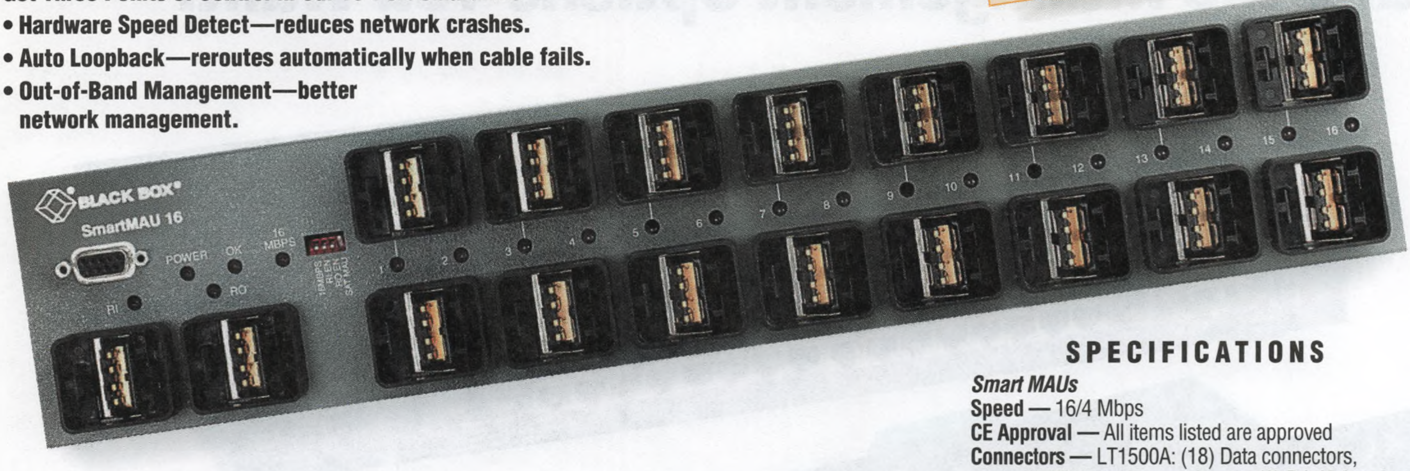
For other lengths and pinnings, see p. 68.

SmartMAU

This MAU Gives You True Network Management and Automatic Speed Detection.

> **"Your Technical Support people are always able to identify *exactly* what I need."**

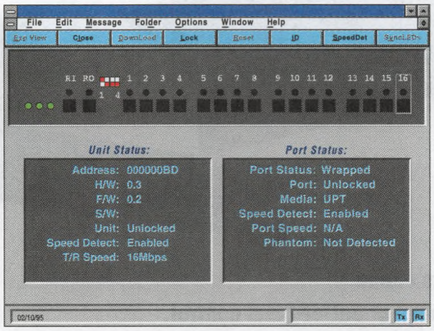
Get Three Points of Control in Our 16-Port SmartMAU:
- **Hardware Speed Detect—reduces network crashes.**
- **Auto Loopback—reroutes automatically when cable fails.**
- **Out-of-Band Management—better network management.**



Hardware Speed Detect prevents a major cause of network crashes—devices entering the ring at the wrong speed. Say you try to boot a 4-Mbps station onto a 16-Mbps Ring. *Crash!* Any workstation running at the wrong speed can do it. But with this MAU, you're safe. The SmartMAU incorporates the speed-detect and lock-out feature in hardware rather than in software—so you get the fastest response time possible.

Auto Loopback protects you, too.

It's on the Ring-In and Ring-Out ports, and it automatically detects cable breaks or shorts in the main ring, then redirects the port to the backup data path. Again, no downtime.



Unit Status:

Address: 000000BD
H/W: 0.3
F/W: 0.2
S/W:
Unit: Unlocked
Speed Detect: Enabled
T/R Speed: 16Mbps

Port Status:

Port Status: Wrapped
Port: Unlocked
Media: UPT
Speed Detect: Enabled
Port Speed: N/A
Phantom: Not Detected

02/10/95

Station down?
SmartMAU shows exactly where the problem is.

Out-of-Band Management does even more.

Just plug in your PC equipped with Windows® SmartMAU Utility Software (included), and you get a graph of MAU and lobe status. You can pinpoint problems immediately. You can manage remotely, too, with a modem. Management software is included.

The SmartMAU is cascadable so expansion of your network is quick and easy. And you can manage all your MAUs with just one PC. When you're in the wiring closet, you can instantly tell what's active because each port and RI/RO has LEDs.

Installing your SmartMAU is easy.

It has mounting brackets for flush or recessed installation in any 19-inch rack.

MORE! MAUs, **see pp. 592–595**, 2-Port Hubs and Media Filters, **see next page.**

SPECIFICATIONS

Smart MAUs

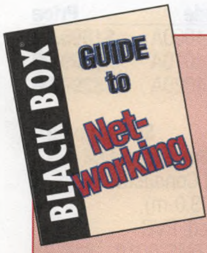
Speed — 16/4 Mbps
CE Approval — All items listed are approved
Connectors — LT1500A: (18) Data connectors, (1) DB9 female console port, (2) RJ-45 female; LT1501A: (20) RJ-45
Indicators — (21) LEDs: (16) Lobe, (1) RI, (1) RO, (1) 16 Mbps, (1) OK, (1) Power
Power — 100 to 230 VAC, 50 to 60 Hz, autosensing
Size — LT1500A: 3.5"H x 17.2"W x 12"D (8.9 x 43.5 x 30.5 cm); LT1501A: 1.7"H x 17.2"W x 12"D (4.4 x 43.5 x 30.5 cm)
Weight — LT1500A: 5.5 lb. (2.5 kg); LT1501A: 4.5 lb. (2 kg)

Software

System Requirements — Windows 3.1 or Windows 95; 386, 486, or Pentium® processor; VGA color monitor; mouse; serial port; 3½-in. high-density floppy drive; 4 MB RAM; 1-MB hard-disk space

FAXBACK INFORMATION
Request Document Number: 15200
Call 412-746-5500 Anytime

Item	Code	Price
SmartMAU Type 1	LT1500A	**$1595.00**
Type 3	LT1501A	**$1195.00**
remember to order cables: Type 1 Adapter Cable, 8-ft. (2.4-m)	EVNTRD9-0008	**$33.95**
For other lengths, see p. 80.		
Type 1 Patch Cable, 8-ft. (2.4-m)	EVNTRPC-0008	**$39.95**
For other lengths, see p. 80.		
Category 5 Solid Conductor Cable, 4-Pair 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		



The *BLACK BOX®* *Guide to Internetworking*—from the Black Box Connectivity Experts!

Get it *HOT* off the presses—24 pages of Black Box information on...

- The essentials of internetworking hardware: bridges, routers, gateways, servers—and more.
- Speed/cost comparisons for ATM, ISDN, and T1, as well as V.34 modems, so you can choose the service that performs best for you.
- Real-world cost-saving strategies for your network.

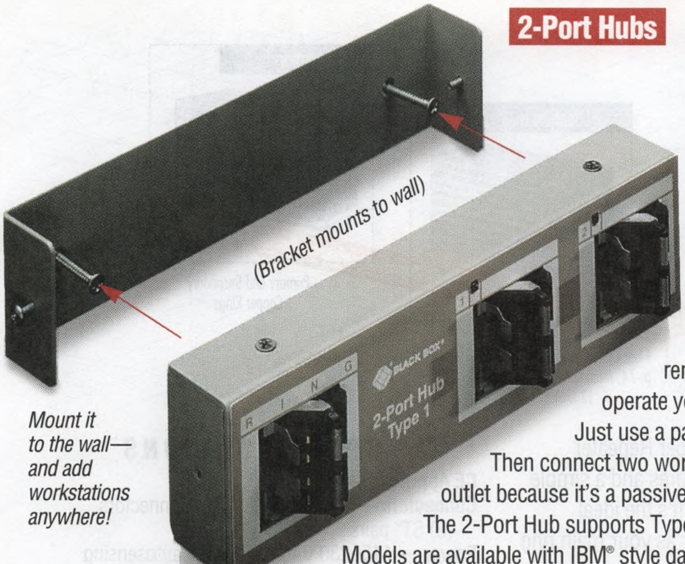
Order now! Just call 412-746-5500—and Black Box connectivity expertise can be yours.

MORE! Technical Guides, **see p. 635.**

2-Port Hubs

Need More Workstations? No More MAU Ports Available? Use Our 2-Port Hub!

- **Connect two workstations to one lobe.**
- **Hot-swappable. No downtime.**
- **No extra MAU port needed.**
- **Nonpowered.**



Mount it to the wall—and add workstations anywhere!

Add two Token Ring workstations even if an extra MAU port is unavailable. This Hub makes Token Ring expansion fast and easy!

Use the 2-Port Hub to double a single lobe's capacity. And you can add or remove workstations from the network without any downtime. This means you can operate your network without the extra MAU—or extra expense—of a backup ring.

Just use a patch cable to connect the 2-Port Hub's ring port to your existing Token Ring outlet. Then connect two workstations to Ports 1 and 2 of the Hub. You don't even need to plug it into a power outlet because it's a passive, nonpowered device.

The 2-Port Hub supports Type 1 or Type 3 Token Ring.

Models are available with IBM® style data connectors for IBM Type 1 cable, unshielded RJ-45 connections for Type 3 unshielded twisted-pair cable, or shielded RJ-45 connections for Type 3 shielded twisted-pair cable.

SPECIFICATIONS

Relay Tool Required — LT037
Speed — 16 or 4 Mbps
CE Approval — All items listed are approved
Connectors — LT7000A: (3) IBM style data connectors;
LT7001A: (3) Unshielded RJ-45;
LT7002A: (3) Shielded RJ-45
Indicators — LEDs: (2) Port Status (1 per port)
Power — Nonpowered
Size — 1.8"H x 6.5"W x 1"D (4.6 x 16.5 x 2.5 cm)
Weight — 0.5 lb. (0.2 kg)

FAXBACK INFORMATION
Request Document Number: 15389
Call 412-746-5500 Anytime

Item	Code	Price
2-Port Hubs		
Type 1	LT7000A	**$210.00**
Type 3 Unshielded	LT7001A	**$185.00**
Type 3 Shielded	LT7002A	**$200.00**
You will also need...		
Relay Tool	LT037	**$82.00**
Type 1 Adapter Cable, 8-ft. (2.4-m) *IBM® Part #6339098*	EVNTRD9-0008	**$33.95**
For other lengths and pinnings, see p. 80.		
Category 5 Solid Conductor Cable, 4-Pair 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		

remember to order **cables**

◆ ◆ ◆

Media Filters

Yes, You Can Use UTP Cable with Your Token Ring Cards.

DB9 to
RJ-11
or
RJ-45

- **Choose from three new RJ-45 options.**
- **Convert DB9 connectors to RJ-45 or RJ-11 connections.**
- **Operate at 16 or 4 Mbps.**
- **Reduce noise on Type 3 cable.**
- **Full compatibility with all Token Ring devices. Meets all IEEE 802.5 standards.**
- **Flexible 6" (15-cm) pigtail allows connections in tight areas.**

New
Single-Case,
Shielded Connector,
and Lengths
LT056A
10-ft. (3.0-m)
Patch Cord
6" Pigtail

With the BLACK BOX® Media Filter, you can use low-cost Type 3 cable in your 16-Mbps Token Ring network, instead of expensive Type 1.

If you want to connect up to 72 workstations on a single Token Ring, use the Media Filter—and get speeds up to 16 Mbps on stations up to 200 feet from their MAUs. You can run at 4 Mbps, too.

A digital pulse transformer and equalization circuitry filter keep noise from corrupting your transmission. They work together to reduce the noise on Type 3 cable and limit RFI and EMI interference.

Three New RJ-45 Options—The Media Filter is available with a 6" (15-cm) pigtail and either an 8-ft. (2.4-m) or 10-ft (3.0-m) patch cord. Or choose the Single Case model in which the Filter is mounted on the DB9 connector and connected to a 10-ft (3.0-m) patch cord.

SPECIFICATIONS

Speed — 4 or 16 Mbps
Connectors — LT056A: (1) DB9 male, (1) RJ-11-to-RJ-11 cable;
LT057: (1) DB9 male, (1) RJ-11-to-RJ-45 patch cord;
LT158A: (1) DB9 male, (1) RJ-45;
LT159A: (1) DB9 male, (1) RJ-45-to-RJ-45 patch cord;
LT160A: (1) DB9 male, (1) RJ-45 to a keyed, shielded RJ-45 outlet on a patch cord
Power — Nonpowered
Size — Plastic case: 0.9"H x 1.5"W x 0.8"D (2.3 x 3.8 x 2 cm)
Weight — 0.3 lb. (0.1 kg)

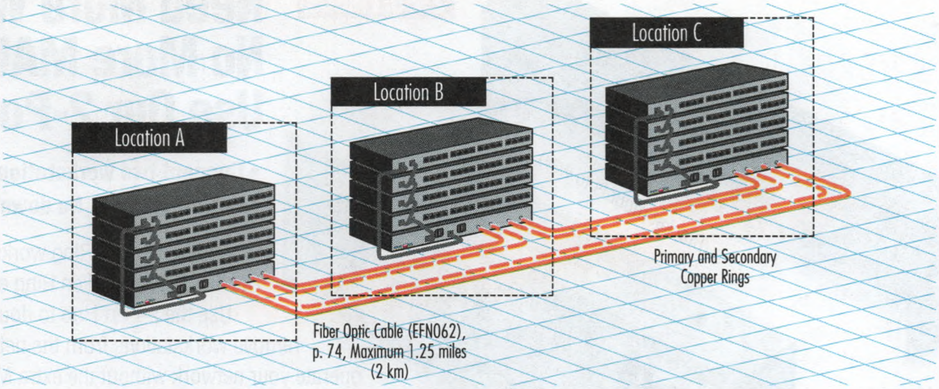
FAXBACK INFORMATION
Request Document Number: 16847
Call 412-746-5500 Anytime

Item	Code	Price
Media Filter		
DB9→RJ-11, 10-ft. (3.0-m) Patch Cord	LT056A	**$49.95**
DB9→RJ-45, 10-ft. (3.0-m) Patch Cord	LT057	**$49.95**
New DB9→RJ-45, 8-ft. (2.4-m) Patch Cord	LT159A	**$41.00**
New DB9→RJ-45, Shielded, 8-ft. (2.4-m) Patch Cord	LT160A	**$49.00**
New DB9→RJ-45, Single Case, 10-ft. (3.0-m) Patch Cord	LT158A	**$55.00**

Fiber Ring Repeater

Set Up a Copper and Fiber Token Ring with Built-In Redundancy.

- **Use one Repeater per site as a backup instead of two. This fault-tolerant Repeater features built-in redundancy.**
- **Converts copper to fiber with retiming.**
- **Extend your main ring 1¼ miles (2 km).**
- **Automatically switches to backup fiber ring when the primary ring goes down.**
- **A copper auto-loopback keeps the copper ring active if a copper wire breaks.**
- **Includes an easy-to-use out-of-band Windows® based GUI software manager.**
- **Autospeed detect and lockout.**


Location A
Location B
Location C
Primary and Secondary Copper Rings

Fiber Optic Cable (EFN062), p. 74, Maximum 1.25 miles (2 km)

This full RI/RO copper-to-fiber Repeater features extensive fail-safe features and a simple network management system. It's the ideal solution if you want to run fiber as your main ring but you require full and automatic backup. And you can use this Repeater in pairs to extend the main ring of a Token Ring network up to 1¼ miles (2 km) by converting copper UTP or STP cabling to fiber. The result—a flexible fault-tolerant network with virtual immunity from electrical interference.

BLACK BOX
Fiber Ring Repeater

SPECIFICATIONS

CE Approval — Yes
Connectors — (2) RJ-45, (2) Data Connectors, (2) ST® pairs
Power — 115–230 VAC, 60–50 Hz, autosensing
Size — 1.5"H x 17.1"W x 10.5"D (3.8 x 43.4 x 26.7 cm)
Weight— 4.5 lb. (2 kg)

FAXBACK INFORMATION
Request Document Number: 16854
Call 412-746-5500 Anytime

Item	Code	Price
Fiber Ring Repeater	LT074A	**$1795.00**
remember to order cables Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific lengths or bulk cable, see pp. 74 and 118.

◆ ◆ ◆

Fiber Optic Converters

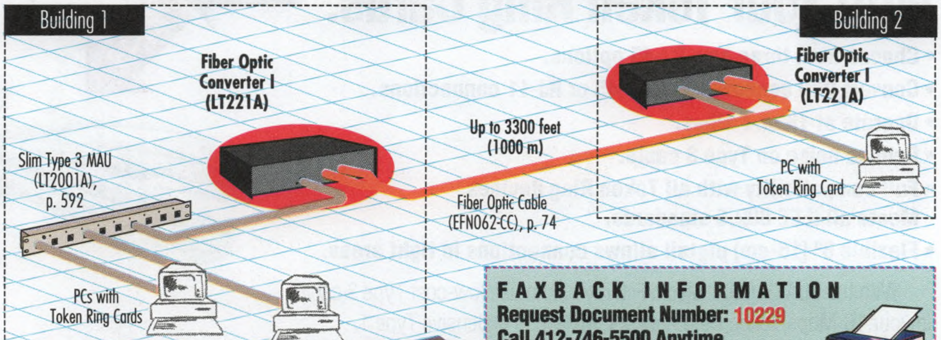
Use Fiber to Extend the Main Ring or a Lobe on Your Type 3 Network.

- **Extend a single lobe with Converter I.**
- **Expand the main ring with Converter II.**

Use the **Fiber Optic Converter I** to attach a single distant workstation to your Token Ring LAN. Connecting the remote workstation to the Converter eliminates the need for a second MAU.

With the Fiber Optic Converter I you can extend a link by as much as 3300 feet (1000 m).

Use the **Fiber Optic Converter II** to extend the reach of your Type 3 Token Ring LAN without affecting the functional main-ring length. It converts the signals of the network's primary and backup paths, so you extend the size of the Token Ring by as much as 3300 feet (1000 m).


Building 1
Building 2
Fiber Optic Converter I (LT221A)
Fiber Optic Converter I (LT221A)
Slim Type 3 MAU (LT2001A), p. 592
Up to 3300 feet (1000 m)
Fiber Optic Cable (EFN062-CC), p. 74
PC with Token Ring Card
PCs with Token Ring Cards

FAXBACK INFORMATION
Request Document Number: 10229
Call 412-746-5500 Anytime

BLACK BOX
FIBER OPTIC CONVERTER I
POWER
DATA

Remember to use one Fiber Optic Converter on each end of the line.

SPECIFICATIONS

Speed — 16 or 4 Mbps
CE Approval — All items listed are approved
Connectors — LT221A: (1) RJ-45 female, (2) ST; LT222A: (2) RJ-45 female, 4) ST
Indicators — Both models: (2) LEDs; Power, Data
Power — 115/230 VAC (switch-selectable), 6 watts
Size — 1.7"H x 11.4"W x 4"D (4.3 x 29 x 10.2 cm)
Weight — 0.2 lb. (< 0.1 kg)

Item	Code	Price
Fiber Optic Converters		
I (1) RJ-45 Connector	LT221A	**$715.00**
II (2) RJ-45 Connectors	LT222A	**$1225.00**
remember to order cables Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific lengths or bulk cable, see pp. 74 and 118.

Intel NetportExpress and NetportExpress PRO Print Servers

Everything You Need for Total Printer Control of Token Ring Networks.

- **Support for 16/4 Mbps Token Ring networks and management consoles.**
- **Protects your equipment investment, too, by adding new life to older printers.**
- **One easy-to-use tool for installation and configuration.**
- **External and internal Print Server solutions for your network printing.**

Activity
Transmit
Receive
NetportExpress™PRO
intel.
PARALLEL 2
PARALLEL 1
SERIAL

With Intel® NetportExpress™ Print Servers from Black Box, it's easy to add, use, and manage printers anywhere on your Token Ring network.

Use your network backbone cable to connect any kind of printer, anywhere you need it—so you don't have to attach printers near your file server. You can also attach older-model printers even if they have dedicated expansion slots.

These Print Servers are small enough that you can install them without disrupting your network. And, if your network goes down, they can reattach themselves once your LAN comes back on line.

PRO Models (Internal or External)

- High-performance printing.
- Multiprotocol environments: NetWare® (native NDS™), Windows NT™, Windows for Workgroups, Windows® 95, UNIX®, AppleTalk®, IPX™/SPX, TCP/IP, NetBIOS.
- Complex printing needs (color, graphics, bitmaps).
- Available for internal MIO connections or external multi-printer connections.

SPECIFICATIONS

Speed — PRO: Token Ring: 16/4 Mbps;
Printer: Up to 200 KBps

CE Approval — All items listed are approved

Connectors — Token Ring: (1) DB9, (1) RJ-45;
Printer: (2) IEEE 1284 parallel;
PRO: Internal: Token Ring: (1) DB9, (1) RJ-45;
Printer: MIO;
External: Token Ring: (1) DB9, (1) RJ-45;
Printer: (2) IEEE 1284 parallel,
(1) DB9 male serial;

Power — PRO: Internal: From the printer;
External: 115/230 VAC switch-selectable;

Size — PRO: Internal: 5.4"H x 5.6"W x 1.1"D
(11.6 x 12.1 x 2.4 cm);
External: 7.3"H x 5.1"W x 1.3"D
(15.7 x 11 x 2.8 cm)

MORE! Intel Products, see pp. 495–496, 498, 536, 549–552, 568, 580, 600.

FAXBACK INFORMATION
Request Document Number: 17604
Call 412-746-5500 Anytime

Item		Code	Price
Intel NetportExpress Print Servers,Token Ring			
PRO	Internal	PCLA3351	**$459.00**
	External	PCLA2351	**$529.00**

NOTE: Standard discounts may not apply.

remember to order cables Parallel Printer Cable, 10-ft. (3.0-m) Male/Male EYN600-0010-MM **$16.95**

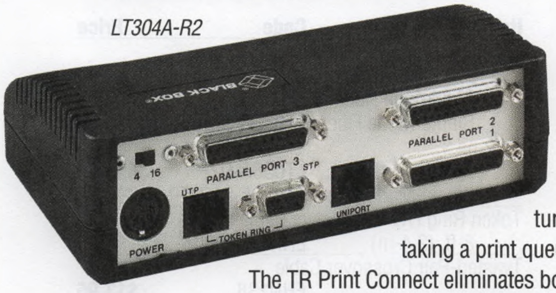
For other lengths and genders, see p. 106.

◆ ◆ ◆

Token Ring Print Servers

Connect Your Printers Directly to Your Novell Token Ring Network.

LT304A-R2



- **TR Print Connect/2 has one parallel port and one Uniport; the TR Print Connect/4 has three parallel ports and one Uniport.**
- **Emulates PServer—you don't need new software.**

Just plug in the cables, and create a print server with the Novell® PConsole. Once you turn on Print Connect, it automatically starts taking a print queue.

The TR Print Connect eliminates bottlenecks with its 32-bit 68340 chip, DMA (direct memory access) technology, and 600,000-bps parallel port output speed. The 100,000-cps output is ultra-high-speed, and all connected printers can receive data simultaneously.

Each TR Print Connect comes equipped with a Uniport. The Uniport acts as a serial port, but can be converted into a parallel port with a Uniport Adapter. Together they enable you to add a full 4000 feet (1219 m) to the scant 20 feet (6 m) of distance you get with a regular parallel port.

FAXBACK INFORMATION
Request Document Number: 15176
Call 412-746-5500 Anytime

SPECIFICATIONS

Speed — 16/4 Mbps

Systems Supported — Novell NetWare 2.15+ and 3.x; all Novell printing utilities, including PConsole, Notify, Capture, Forms

CE Approval — 230-VAC versions: LT302AE-R2, LT304AE-R2

Connectors — LT302A-R2: (1) DB25 female (parallel); LT304A-R2: (3) DB25 female (parallel); Both Units: (1) DB9 female, (1) RJ-45 female (Token Ring), (1) RJ-45 female (Uniport)

Indicators — (1) LED for status of print job, unit, network file server, and printer

Power — Both models: 110/230 VAC, 60/50 Hz, external autosensing power supply; LT302A-R2: 1 Amp; LT304A-R2: 1.5 Amps

Size — 2"H x 7"W x 4"D (5.1 x 17.8 x 10.2 cm)

Weight — 1.2 lb. (0.5 kg)

Item		Code	Price
TR Print Connect			
	2-Port	LT302A-R2	**$895.00**
	4-Port	LT304A-R2	**$995.00**
Uniport Adapter		LT310A	**$90.00**

remember to order cables Parallel Printer Cable, 10-ft. (3.0-m) Male/Male EYN600-0010-MM **$16.95**

For other lengths and genders, see p. 106.

Intel TokenExpress LAN Adapters

The Token Ring Network Cards You Just Plug In and Forget.

intel.
Intel TokenExpress PRO LAN Adapter with Flash
Intel TokenExpress PRO
LAN Adapter with Flash
The powerful LAN connection for Intel486 and Pentium processor-based client PCs.
Designed for superior client system performance
Includes FlashWorks for:
Simple one-step switchless installation
Fast, centralized driver update
Built-in virus protection
intel.

- **Interoperable with all IBM environments.**
- **Meets IEEE 802.2 and 802.5 standards.**
- **Supports high-performance drivers for all popular network operating systems.**
- **Fully software configurable.**

Fast, affordable Intel® TokenExpress™ LAN Adapters make Token Ring networks simpler to build, use, and manage. Each is compatible with the entire IBM® hardware and software environment, so installation is fast and easy.

The ISA16/4 uses the exclusive Intel TokenSet™ software to configure interrupts, I/O addresses, and the DMA channel automatically. The EISA and MCA boards use standard switchless configuration. The high-performance PRO model is designed specifically for use with Intel 486 or Pentium® processor-based workstations.

SPECIFICATIONS

Memory — ISA/16s, MCA, EISA: 128 KB; EISA/32: 512 KB; PRO: 384 KB
Speed — 16 or 4 Mbps
CE Approval — All items listed are approved
Connectors — (1) DB9, (1) RJ-45

FAXBACK INFORMATION
Request Document Number: 17594
Call 412-746-5500 Anytime

Item	Code	Price
Intel TokenExpress LAN Adapters		
ISA/16	PCLA8130B	**$329.95**
ISA/16 (10-Pack)	PCLA8130BPAK10	**$2899.95**
EISA	EILA8245	**$649.95**
PRO	PCLA8155	**$255.95**
PRO (10-Pack)	PCLA8155PAK10	**$2439.95**
PRO (50-Pack)	PCLA8155PAK50	**$10,599.00**
remember to order cables — Category 5 Solid Conductor Cable 4-Pair, 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**

For other lengths and pinnings, see p. 68.

NOTE: Standard discounts may not apply.

MORE! Intel® Products, see pp. 495–496, 498, 536, 549–552, 568, 580, 599.

* * *

Token Ring Fiber Optic Transceiver

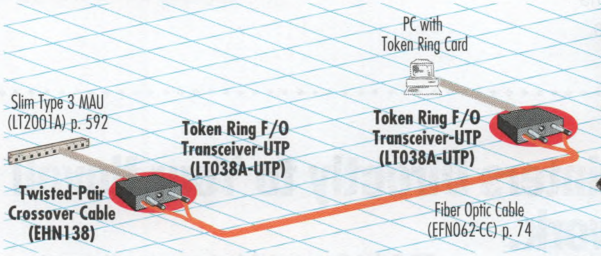
Extend Lobe Distances—over One Mile!

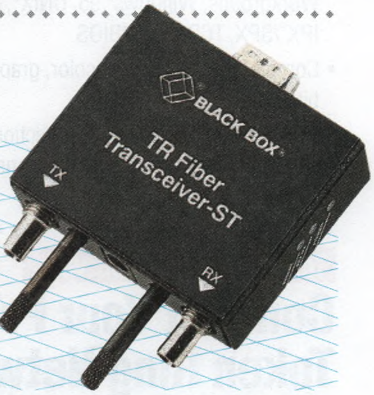
- **Converts a Token Ring signal from copper to fiberoptic and vice versa.**
- **Now supports single-mode fiber for lobe distances up to 1¼ miles (20 km).**
- **Fully automatic operation.**
- **Choose Type 1 or Type 3 Token Ring, single-mode or multimode fiber.**

For an economical way to extend the distance of a single lobe over fiberoptic cable, the Token Ring Fiber Optic Transceiver is your answer. Connect a Type 1 or Type 3 Token Ring MAU to a F/O Transceiver. Then attach either single-mode or multimode fiber cable to another F/O Transceiver and connect to your lobe up to 1¼ miles (20 km) away—it's that simple!

Each Transceiver operates at 4 or 16 Mbps, and features autoconfiguration. And to help keep data safe, the Transceivers compensate for attenuation by reconstructing and reshaping the data signal.

Remember to use one Token Ring F/O Transceiver on each end of the line. Use the included power supply on the MAU side. It's optional on the PC side.


PC with Token Ring Card
Slim Type 3 MAU (LT2001A) p. 592
Token Ring F/O Transceiver-UTP (LT038A-UTP)
Token Ring F/O Transceiver-UTP (LT038A-UTP)
Twisted-Pair Crossover Cable (EHN138)
Fiber Optic Cable (EFN062-CC) p. 74


BLACK BOX
TR Fiber Transceiver-ST
TX
RX

SPECIFICATIONS

Speed — 16 or 4 Mbps
CE Approval — LT038A
Connectors — LT038A: (1) DB9 male, (2) ST®; LT038A-SM: (1) DB9 male, (2) ST single-mode fiber; LT038A-UTP: (1) RJ-45, (2) ST single-mode fiber; LT038A-SMUTP: (1) RJ-45, (2) SMA
Indicators — LEDs: Insert, F/O OK, PWR
Power — +5 V between Pins 3 and 8 of the DB9 connector from the NIC, or external 9-V, 500-mA power supply
Size — 0.8"H x 2.4"W x 3.5"D (2 x 6.1 x 8.9 cm)
Weight — 0.3 lb. (0.1 kg)

FAXBACK INFORMATION
Request Document Number: 15310
Call 412-746-5500 Anytime

Item	Code	Price
Token Ring F/O Transceiver		
Type 1		
Multimode Fiber	LT038A	**$495.00**
Single-Mode Fiber	LT038A-SM	**$1095.00**
Type 3		
Multimode Fiber	LT038A-UTP	**$495.00**
Single-Mode Fiber	LT038A-SMUTP	**$1095.00**
Token Ring F/O Transceiver Cable 8-ft. (2.4-m)	EHM057-0008	**$39.35**
Twisted-Pair Crossover Cable	EHN138	**$13.95**
remember to order cables — Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific applications or bulk cable, see pp. 74 and 118.

In This Section... More LAN · MAUs · Media Filters · Converters

New Compact PC Cards Give You Two Ways to Link to Token Ring.

Token Ring

Token Ring Type 1 & Type 3
BLACK BOX (412) 746-5500
TOKEN RING
PC CARD

The Token Ring PC Card (LT8001A) has Type-1 (DB9) and Type-3 (RJ-45) connectors.

Token Ring/Modem 28.8

Token Ring & 28.8-Kbps Modem
UTP Media Filter
BLACK BOX (412) 746-5500
TOKEN RING / MODEM 28.8
PC CARD

The Token Ring/Modem 28.8 PC Card (LT8002A) has Type-1 (DB9) and Type-3 (RJ-45) Token Ring ports, plus an RJ-11 connector for your phone line.

Token Ring PC Cards

EXCLUSIVE

Token Ring PC Card

- Easily connect your laptop or portable computer to a Token Ring network.
- Supports all PCMCIA 2.1, Type II PCs and a wide selection of drivers.
- Access to ISO and SNA protocols via LLC 802.2.
- Support for APPC/PC, NetBIOS, 3270, and AS/400®.

PLUS! Ethernet PC Cards, **see p. 571,** Fast Ethernet PC Cards, **see p. 497.**

Token Ring/Modem 28.8 PC Card

- Connects your portable PC to Token Ring and has a built-in 28.8-Kbps fax/modem.
- Also supports V.22A/B, V.23, V.21, and Bell 212A and 103.
- Simultaneous Token Ring and modem access.
- Supports all PCMCIA 2.1, Type II-compliant PCs and a wide selection of drivers.
- Access to ISO and SNA protocols via LLC 802.2.
- Supports APPC/PC, NetBIOS, 3270, and AS/400®.

FAXBACK INFORMATION
For Token Ring Modem 28.8 PC Card: 16328
For Token Ring PC Card: 16304
Call 412-746-5500 Anytime

TOKEN RING PC CARD COMPATIBILITY WITH NOSs

BUYER'S GUIDE

Network Operating Systems	Token Ring PC Card (LT8001A)	Token Ring/ Modem 28.8 PC Card (LT8002A)
Chameleon® NEWT	✓	✓
DEC™ PATHWORKS®	✓	✓
FTP Lanwatch	✓	✓
IBM® LAN Server V	✓	✓
IBM OS/2® LAN Server	✓	✓
IBM PC LAN	✓	✓
LANtastic® X	✓	✓
Microsoft® LAN Manager	✓	✓
Novell® DOS 7	✓	✓
Novell NetWare® 2.x, 3.x, 4.x	✓	✓
Novell NetWare Lite™	✓	✓
OS/2® Warp	✓	
Windows® 95	✓	✓
Windows for Workgroups	✓	✓
Wollongong Pathway	✓	✓

SPECIFICATIONS

Interface Standards — PCMCIA 2.1, Type II
PCMCIA Support — Cards and Socket Services Direct Enablers
Token Ring Standard — IEEE 802.2 and 802.5
CE Approval — LT8002A
Connectors — Both: (1) DB9 female, (1) RJ-45 female; LT8002A also has (1) RJ-11 female
Power — LT8001A: 350 mA (Active); LT8002A: 380 mA (Active)
Size — 0.2"H x 2.1"W x 3.4"D (0.5 x 5.4 x 8.5 cm)
Weight — LT8001A: 0.1 lb. (0.1 kg); LT8002A: 0.3 lb. (0.1 kg)

Item	Code	Price
Token Ring PC Card	LT8001A	$445.00
Token Ring/Modem 28.8 PC Card	LT8002A	$679.00

remember to order **cables**

Category 5 Solid Conductor Cable 4-Pair, 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	$10.95

For other lengths and pinnings, see p. 68.

Token Ring Modular Parallel Adapters

Make On-the-Spot LAN Connections—Anywhere!

- **Make easy connections to any Token Ring LAN. Great for portable PCs.**
- **Supports Enhanced Parallel Ports (EPP) for super-fast connections.**

Now make FAST Token Ring connections in a snap. Just plug a Modular Parallel Adapter into your PC's parallel port. Instantly, you're ready to make a network connection. Choose Type 1 or Type 3 Adapters, or use the Combo Adapter (pictured) with interchangeable Modular Media Units for *either* cable type!

These Units are available to convert standalone Type 1 or Type 3 Adapters for use with the opposite cable type.

Our Tech Support Experts recommend using a Modular Parallel Mux to split your PC's parallel port into two separate ports. That way you can attach a Modular Parallel Adapter and still maintain a separate port for your printer.

No Jumpers. No Switches. Just Plug Them In!
BLACK BOX
Type 1
Type 3

Plug into Type 1 or Type 3 Token Ring. With the new ***Combo Adapter (LT097A)****, the choice is yours!*

EXCLUSIVE

SPECIFICATIONS

NOS Drivers — NDIS 2.01, NDIS3
Power Consumption — 350 mA
Support — EPP
Size — 4"H x 2.4"W x 1.0"D (10.3 x 6.1 x 2.5 cm)
Weight — 0.2 lb. (<0.1 kg)

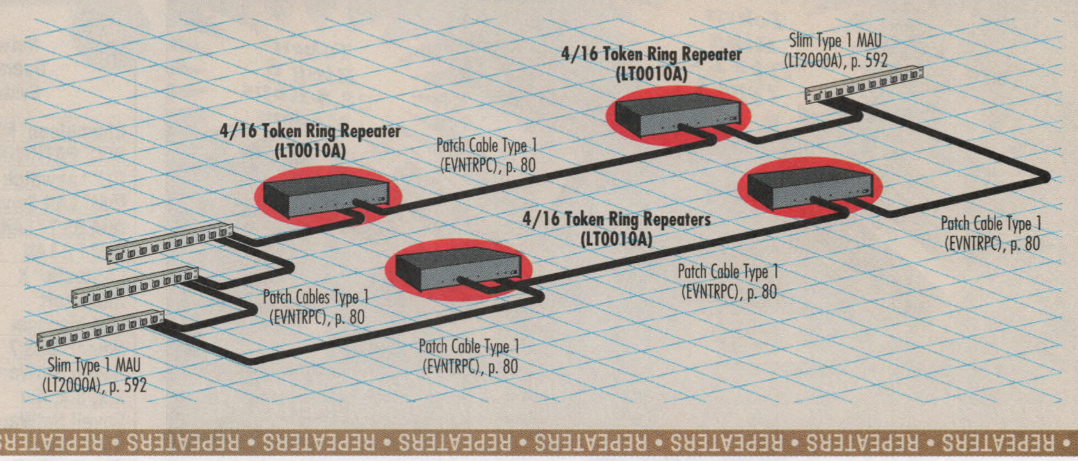
FAXBACK INFORMATION
Request Document Number: 15216
Call 412-746-5500 Anytime

Item	Code	Price
Modular Parallel Adapters for Token Ring		
Type 1	LT098A	$419.00
Type 3	LT099A	$419.00
Combo (Type 1 & Type 3)	LT097A	$479.00
Optional Modular Media Units		
TR-T1 (Type 1)	LT198	$99.00
TR-T3 (Type 3)	LT199	$99.00
Modular Parallel Mux	LE170	$89.00

PLUS! Ethernet Modular Parallel Adapters. See p. 569.

StretcH Main Ring and Lobe Distances

A Repeater is used to increase either main ring or lobe lengths in a Token Ring. The main ring length is the distance between MAUs. The lobe length is the distance from MAU to workstation. Type 1 Token Ring networks use Type 1 cable with IBM® style universal data connectors. They operate at either 16 or 4 Mbps.


4/16 Token Ring Repeater
(LT0010A)
Slim Type 1 MAU
(LT2000A), p. 592
4/16 Token Ring Repeater
(LT0010A)
Patch Cable Type 1
(EVNTRPC), p. 80
4/16 Token Ring Repeaters
(LT0010A)
Patch Cable Type 1
(EVNTRPC), p. 80
Patch Cable Type 1
(EVNTRPC), p. 80
Patch Cables Type 1
(EVNTRPC), p. 80
Patch Cable Type 1
(EVNTRPC), p. 80
Slim Type 1 MAU
(LT2000A), p. 592

4/16 Token Ring Repeaters

BLACK BOX
4/16 TR REPEATER
POWER
LOOPBACK

- **Runs at 16 or 4 Mbps.**
- **LEDs enable you to monitor the network faults and corrupt signals at a glance.**
- **Auto Loopback compensates for cable breaks.**
- **Phase (locked) loop technology for extra distance.**
- **Eliminate synchronization problems with built-in jitter (attenuation) suppression.**

Extend the Main Ring or the Distance between MAU and Workstation.

Get extra distance and more versatility in a single repeater. These 4/16 Token Ring Repeaters run at either 16 or 4 Mbps over Type 1 and Type 3 shielded or unshielded UTP Cable.

Connect Type 1 to Type 1, Type 3 to Type 3, or Type 1 to Type 3. The Repeaters automatically sense which two ports are being used, so there are no jumpers or switches to set—*ever.*

Use these Repeaters to extend your main ring or to add distance to a workstation lobe. With phase (locked) loop technology, at 16 Mbps you get a distance boost of up to 800 feet (240 m) over Category 5 UTP cable. And you can add more than the standard 72 workstations on Type 3 Token Ring.

The Repeaters have two RJ-45 UTP and two IBM® DC STP connectors, which means you can use one unit with any UTP or STP wiring combination. Auto loopback provides automatic fault tolerance upon cable breaks or disconnects.

Need to send data even farther? *You need BLACK BOX® Fiber Repeaters!*
To connect Type 1 to fiber—*order our Type 1 16-MB Fiber Repeater (LT071A) on **page 603**.*
To connect Type 3 fiber—*order our Type 3 16-MB Fiber Repeater (LT073A) **page 603**.*

SPECIFICATIONS

Speed — 16 or 4 Mbps
CE Approval — All items listed are approved
Connectors — (2) Data connectors, (2) RJ-45
Indicators — LEDs: (1) Power, (1) Data, (2) Loopback
Power — 115–230 VAC, 50–60 Hz, autosensing
Size — 1.7"H x 11.4" W x 9"D (4.3 x 29 x 22.9 cm)
Weight — 3.5 lb. (1.4 kg)

Item	Code	Price
4/16 Token Ring Repeaters (Copper)	LT0010A	**$995.00**
with Jitter Suppression	LT0015A	**$1495.00**

◆ ◆ ◆

Token Ring Repeaters 4 Mbps

Economical LAN Extension for 4-Mbps Networks.

- **LEDs for network signal and station activity.**
- **Double your Token Ring distances.**
- **Run at 4 Mbps.**

BLACK BOX
TR REPEATER TYPE 1
POWER
BLACK BOX
TR REPEATER TYPE 3
POWER
STATION ACTIVE
DATA
RING FAULT

Use these Repeaters to extend your Type 1 lobes up to 2400 feet (730 m) and your Type 3 lobes to 900 feet (275 m).

Or use one or more of these Repeaters for more distance in your main ring.

SPECIFICATIONS

Speed — 4 Mbps
CE Approval — All items listed are approved
Connectors — LT060A: (2) IBM data connectors; LT062A: (2) RJ-45 female
Indicators — (4) LEDs: Power, Data, Ring Fault, Station Active
Power — 115/230 VAC, switch-selectable
Size — 1.7"H x 11.4"W x 6.2"D (4.3 x 29 x 15.8 cm)
Weight — 3 lb. (1.4 kg)

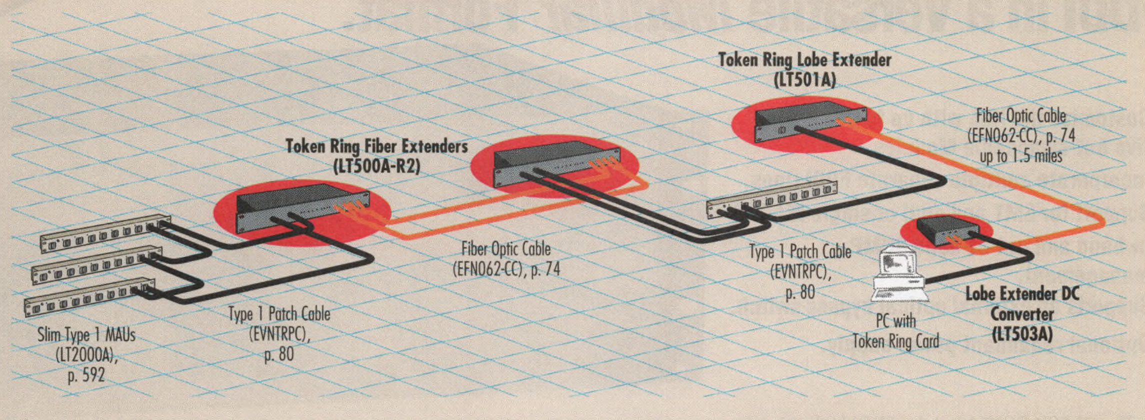
Item	Code	Price
TR Repeaters		
Type 1	LT060A	**$870.00**
Type 3	LT062A	**$815.00**
remember to order cables — Type 1 Patch Cable, 8-ft. (2.4-m)	EVNTRPC-0008	**$39.95**
	For other lengths, see p. 80.	
Type 1 Adapter Cable, 8-ft. (2.4-m)	EVNTRD9-0008	**$33.95**
	For other lengths, see p. 80.	
Category 3 Solid Conductor Cable, PVC Straight-Pinning	EYN730MS-MM	**$6.95 + $.11/ft.**

For plenum applications or cross-pinning, see p. 70.

with BLACK BOX® Repeaters.

Type 3 Token Ring networks use Type 3 twisted-pair cable with easy-to-use modular connections. They operate at either 16 or 4 Mbps.

Both Type 1 and Type 3 Token Ring networks can be extended to 1.5 miles (2.4 km) with fiber repeaters and cable.


Token Ring Lobe Extender
(LT501A)
Fiber Optic Cable
(EFN062-CC), p. 74
up to 1.5 miles
Token Ring Fiber Extenders
(LT500A-R2)
Fiber Optic Cable
(EFN062-CC), p. 74
Type 1 Patch Cable
(EVNTRPC),
p. 80
Lobe Extender DC
Converter
(LT503A)
PC with
Token Ring Card
Type 1 Patch Cable
(EVNTRPC),
p. 80
Slim Type 1 MAUs
(LT2000A),
p. 592

Token Ring Fiber Extenders

New
Rx
Rx Alarm
Tx
Fiber Inserted
Copper Inserted
Power
BLACK BOX
Token Ring Fiber Extender Single
Rx
Rx Alarm
Tx
Fiber Inserted
Copper Inserted
A
Class 1 Laser
Power
Rx
Rx Alarm
Tx
Fiber Inserted
B
BLACK BOX
(412) 746-5500
Token Ring Fiber Extender Dual

- **Dual- and single-link versions available.**
- **Supports both the 802.5 and 802.5J Token Ring standard.**
- **Easily rackmounted in 19" Chassis.**

Connect Any Combination of Token Ring Devices with Fiber.

With support for both the 802.5 and 802.5J standards, Black Box's **Token Ring Fiber Extenders** provide fiber connectivity for all Token Ring technologies.

Configure your extender for single or dual redundant connections between any combination of Token Ring devices, such as switches, servers, hubs, MAUs, NICs, and bridges. You can use these devices for lobe extension, station-to-station links, concentrator-to-concentrator links, or even dual redundant station links.

House up to 16 Extender modules in our **19" Rackmount Chassis**, which stands three rack units high. You can also install an optional **Rackmount Power Supply** in the Chassis for support of up to 14 devices.

SPECIFICATIONS

Speed — 4 or 16 Mbps
CE Approval — All items listed are approved
Connectors — LT510A: (2) single-link fiber ST;
LT511A: (4) dual-link fiber ST;
Both: (1) copper shielded RJ-45
Indicators — LEDs: (1) Power, (1) Alarm, (1) copper inserted, (1) fiber inserted
Power — 12V, with optional 110V external DC adapter
Size — LT510A: 1"H x 3.9"W x 5.5"D (2.5 x 10 x 14 cm);
LT511A: 2"H x 3.9"W x 5.5"D (5 x 10 x 14 cm)
Weight — 3.3 lb. (1.5 kg)

Item	Code	Price
Token Ring Fiber Extenders		
Single-Link	LT510A	**$595.00**
Dual-Link	LT511A	**$895.00**
19" Rackmount Chassis	RM510	**$140.00**
Rackmount Power Supply	PS5000	**$690.00**
remember to order cables Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific lengths or bulk cable, see pp. 74 and 118.

16-MB Fiber Repeaters

The Fiber Repeater for Inter-Building Links.

SPECIFICATIONS

Speed — 16 or 4 Mbps
CE Approval — All items listed are approved
Connectors — LT071A: (1) IBM® data connector (2) ST: Transmit and Receive;
LT073A: (1) RJ-45 female, (2) ST: Transmit and Receive
Indicators — LEDs: (1) Power, (1) Data, (1) Station, (2) Loopback
Power — 115/230 VAC, switch-selectable
Size — 1.7"H x 11.4"W x 6.2"D (4.3 x 29 x 15.8 cm)
Weight — 3 lb. (1.4 kg)

- Link your Token Ring to a ring in another building.
- Get 8000 feet (2440 m) of distance over fiber.
- Receive and generate data on both the main ring and the backup path.

BLACK BOX
16 MB FIBER REPEATER-TYPE 1
BLACK BOX
16 MB FIBER REPEATER-TYPE 3

FAXBACK INFORMATION
Request Document Number: 11347
Call 412-746-5500 Anytime

Item	Code	Price
16-MB Fiber Repeaters		
Type 1	LT071A	**$1595.00**
Type 3	LT073A	**$1550.00**
remember to order cables Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For specific lengths or bulk cable, see pp. 74 and 118.

Item	Code	Price
Stranded Loose-Outside-Plant Fiber Optic Cable 6-Fiber	EFN3006A	**$2.00/ft.**

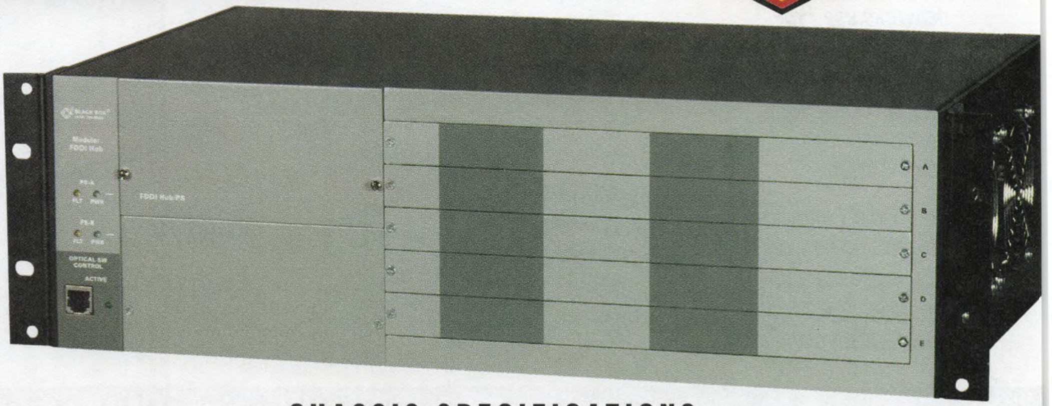
For other fiber counts, see p. 118.

Modular FDDI Hubs

All the Bandwidth and Distance of FDDI in a Versatile *Modular* Format.

New

- **Customize the Hub with up to five hot-swappable Modules.**
- **Incorporate multiple separate FDDI rings.**
- **Support for SMT and dual or single MAC.**
- **In-band and out-of-band SNMP management.**
- **Supports an external optical bypass switch.**
- **Optional redundant power supply.**



The BLACK BOX® Modular FDDI Hub is an ideal solution for building a large network around an FDDI backbone. Use the Modular FDDI Hub to connect FDDI devices to each other or to other LANs over single-mode or multimode fiber, and STP or UTP Cable. Modular construction means you can customize the basic chassis to fit your applications precisely.

The Chassis—Start with the Chassis. Each Chassis can accommodate up to five Modules and is designed for convenient rackmounting. And because the Modules are hot-swappable, you can change interfaces without shutting down your network. The Chassis includes a common-logic unit and is available with one or two power supplies. An RJ-45 port is provided for a manual optical bypass switch.

The Bridge Module—This Four-Port Ethernet-to-FDDI Bridge operates as a translation bridge for connecting Ethernet stations to an FDDI backbone. It supports up to 1000 Ethernet workstations and provides direct bridging between four Ethernet ports without loading the FDDI network.

The MAC Modules—The MAC Module (Media Access Control) provides management for both the Hub and the attached FDDI network. You can manage your network with any SNMP Management station.

The Module is available for both single- and dual-MAC operation.

The Access Modules—These Modules provide two or four FDDI ports. Each port gives you physical access to FDDI stations, concentrators, or bridges. And you can use them to expand your FDDI LAN. Interface options are multimode and single-mode fiber, and shielded and unshielded twisted-pair copper.

FAXBACK INFORMATION
Request Document Number: 19235
Call 412-746-5500 Anytime

CHASSIS SPECIFICATIONS

Protocol — FDDI, Ethernet
CE Approval — All items listed are approved
Connectors — (1) RJ-45 (for manual optical bypass switch)
Indicators — LEDs: (2) Power, (2) Power Fault, (1) Optical Switch Control
Power — Plug-in power supply operates at 90–260 VAC, 47–63 Hz, power input 200 Va max
Size — Chassis: 5.3"H x 19"W x 9.6"D (13.5 x 48.3 x 24.4 cm)
Weight — Chassis: 10.3 lb. (4.7 kg)

BUYER'S GUIDE

MODULAR FDDI HUB ACCESS MODULES

Module	Transmission Media	Transmission Range	Operating Wavelength	Output Optical Power	Receiver Sensitivity	Optical Budget
STD MIC Interface	Multimode Fiber 62.5/125	2Km/6000 ft.	1300 nm	-19 dBm	-31 dBm	12 dB
ST® Multimode Connector	Multimode Fiber 62.5/125	2Km/6000 ft.	1300 nm	-19 dBm	-31 dBm	12 dB
ST Single-Mode Connector	Single-Mode Fiber 9/125	Up to 30 km	1300 nm	-7 dBm	-31 dBm	24 dB
DB9 Connector	Shielded Twisted Pair	100 m/ 300 ft.	NA	NA	NA	NA
UTP Interface	Category 5 UTP	100 m/ 300 ft.	NA	NA	NA	NA

Item		Code	Price
Modular FDDI Hub (Chassis/Power Supply/Common-Logic Unit)		LT0002A	**$1000.00**
with Redundant Power Supply		LT0002A-RD	**$1700.00**
Four-Port Ethernet Bridge Modules	AUI Connector	LT0002A-4AUI	**$5000.00**
	UTP Connector	LT0002A-4UTP	**$5000.00**
MAC Modules	MAC-1	LT0002A-MAC1	**$2400.00**
	MAC-2	LT0002A-MAC2	**$2900.00**
Access Modules			
2-Port	STD MIC Interface	LT0002A-2MIC	**$1600.00**
	ST Multimode Connector	LT0002A-2STM	**$2300.00**
	ST Single-Mode Connector	LT0002A-2STS	**$4400.00**
	DB9 Connector (STP Cable)	LT0002A-2STP	**$1500.00**
	UTP Interface	LT0002A-2UTP	**$1600.00**
4-Port	STD MIC Interface	LT0002A-4MIC	**$2200.00**
	ST Multimode Connector	LT0002A-4STM	**$3500.00**
	ST Single-Mode Connector	LT0002A-4STS	**$8000.00**
	DB9 Connector (STP Cable)	LT0002A-4STP	**$2000.00**
	UTP Interface	LT0002A-4UTP	**$5000.00**

remember to order cables

	Code	Price
Category 5 Solid Conductor Cable, 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**
Ethernet Transceiver Cable, 10-ft. (3.0-m)	LCN200-0010	**$55.95**
FDDI Jumper Cable, OFNP Plenum, 10-ft. (3.0-m)	EFN4002-003M	**$109.95**
Single-Mode Duplex Fiber Optic Cable, PVC, ST-ST	EFN5009	**$159.95 + $8.95/m.**
Bulk Duplex Fiber Optic Cable, PVC, ST-ST	EFN062-CC	**$79.95 + $.70/ft.**

For other lengths and pinnings, see p. 68.
For other lengths, see p. 78.
For other lengths, see p. 75.
For other lengths, see p. 76.
For specific lengths or bulk cable, see pp. 74 and 118.

FDDI/Ethernet Bridges

Connect Ethernet Workstations to an FDDI Backbone.

- **Connection for four Ethernet segments to FDDI.**
- **Direct bridging between Ethernet segments.**
- **In-band or out-of-band SNMP manageable.**
- **Self-learning translation bridge.**
- **State-of-the-art RISC processor and hardware memory management for top performance.**

Use the four Ethernet ports to connect four Ethernet segments with a total of up to 1000 workstations to an FDDI backbone. Or get direct bridging among the four Ethernet segments without loading the FDDI network.

Manage the Bridge either in-band or out-of-band with any SNMP agent.

Use the masking options to filter unwanted broadcasts and for network security.

SPECIFICATIONS

Filtering Rate — 560,000 frames per second
Forwarding Rate — 40,000 frames per second
Speed — FDDI: 100 Mbps; Ethernet: 10 Mbps
CE Approval — All items listed are approved
Connectors — LT0003A-4DMI: (4) AUI DB15 Female, (1) DB9 Male, (2) MIC Fiber;
LT0003A-4SMI: (4) AUI DB15 Female, (1) DB9 Male, (1) MIC Fiber;
LT0003A-4UMI: (4) RJ-45 10BASE-T, (1) DB9 Male, (2) MIC Fiber
Size — 1.6"H x 10"W x 9.3"D (4 x 25.4 x 23.6 cm)
Weight — 1.8 lb. (0.8 kg)

FAXBACK INFORMATION
Request Document Number: 19259
Call 412-746-5500 Anytime

Item	Code	Price
FDDI/Ethernet Bridges		
AUI Interface, Dual FDDI Station	LT0003A-4DMI	**$4900.00**
AUI Interface, Single FDDI Station	LT0003A-4SMI	**$4400.00**
UTP Interface, Dual FDDI Station	LT0003A-4UMI	**$4900.00**
remember to order cables Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		
FDDI Jumper Cable, OFNP Plenum, 10-ft. (3.0-m)	EFN4002-003M	**$109.95**
For other lengths, see p. 75.		
Ethernet Transceiver Cable, 10-ft. (3.0-m)	LCN200-0010	**$55.95**
For other lengths, see p. 78.		

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Lobe Access Units

Connect Four Workstations to Token Ring through a *Single* Four-Wire Cable.

Connect several remote workstations with one cable—and save money in the process!

- **Add up to four workstations through a single four-wire cable.**
- **Extend the capacity of a Token Ring Lobe.**
- **For Type 1 or Type 3 Token Ring.**
- **Compatible with 4- or 16-Mbps Token Ring.**

Connect up to four workstations to one Token Ring lobe through a single four-wire cable. Or use the internal switch to operate the device as a standalone unit to support a small LAN.

SPECIFICATIONS

Data Rate — 4/16 Mbps, autosensing
CE Approval — All items listed are approved
Connectors — LT0009A: (5) DB9 (1) female, (4) male;
LT0009A-UTP: (5) RJ-45 female
Indicators — LEDs
Power — Interface powered
Size — 7.3"H x 4.5"W x 1.5"D (18.4 x 11.4 x 3.8 cm)
Weight — 0.8 lb. (0.4 kg)

FAXBACK INFORMATION
Request Document Number: 19211
Call 412-746-5500 Anytime

Item	Code	Price
Lobe Access Units, Four-Port		
DB9 Ports (Type 1)	LT0009A	**$325.00**
RJ-45 Ports (Type 3)	LT0009A-UTP	**$325.00**
remember to order cables Type 1 Token Ring Cable, 8-ft. (2.4-m)	EVNTRD9-0008	**$33.95**
For other lengths, see p. 80.		
Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		

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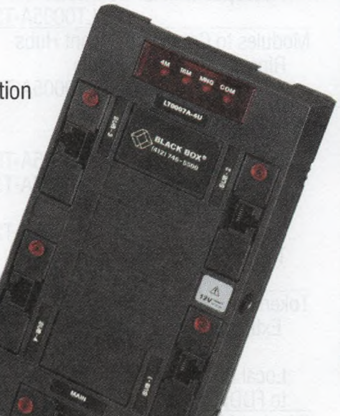
Smart Lobe Access Unit

The SMART Way to Connect up to Four Workstations to a Token Ring Lobe.

- **A full set of management and line-fault-detection features.**
- **Supports 4- and 16-Mbps Token Ring.**

Connect two or four workstations to a single lobe. Line-fault detection automatically disconnects the Smart Lobe Access Unit from the main ring so shorts, open circuits, or incorrect data rates don't interrupt performance. It supports full in-band management including security.



SPECIFICATIONS

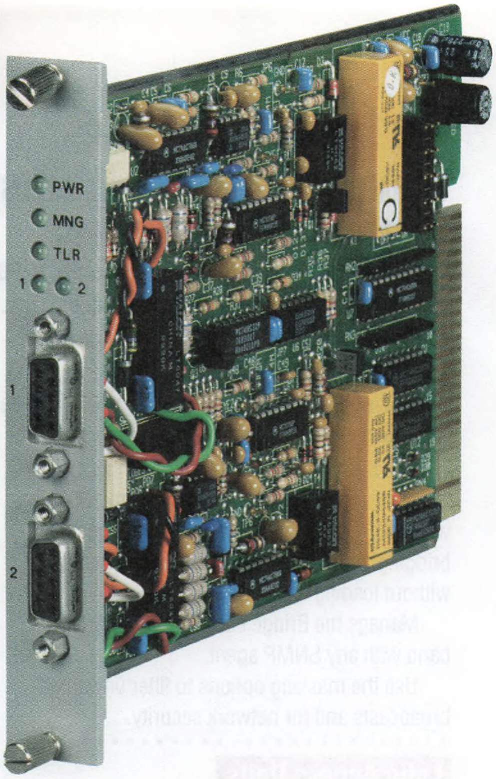
Data Rate — 4/16 Mbps, autosensing
CE Approval — All items listed are approved
Connectors — LT0007A-2U: (2) shielded RJ-45;
LT0007A-2SU: (2) unshielded RJ-45;
LT0007A-4U: (4) shielded RJ-45;
LT0007A-4SU: (4) unshielded RJ-45
Indicators — LEDs
Power — 115 or 230 VAC via an external DC power supply (can also be powered remotely via pins 7 and 8 of main connector)
Size — 7.3"H x 4.5"W x 1.5"D (18.4 x 11.4 x 3.8 cm)
Weight — 2 lb. (.9 kg)

FAXBACK INFORMATION
Request Document Number: 19194
Call 412-746-5500 Anytime

Item	Code	Price
Smart Lobe Access Unit		
2-Port		
Type 3	LT0007A-2U	**$350.00**
Type 1	LT0007A-2SU	**$375.00**
4-Port		
Type 3	LT0007A-4U	**$450.00**
Type 1	LT0007A-4SU	**$480.00**
remember to order cables Type 1 Token Ring Cable, 8-ft. (2.4-m)	EVNTRD9-0008	**$33.95**
For other lengths, see p. 80.		
Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		

Modular Intelligent Hubs

Capable *Modular* Hubs for Total Token Ring Flexibility.



- **Chassis holds up to 20 hot-swappable modules.**
- **Each Hub supports up to 80 Token Ring workstations in one or multiple rings.**
- **You can even add one Ethernet segment per Hub.**
- **SNMP management.**
- **Automatic fault recovery and security.**
- **Redundant power supply helps to protect you from unexpected downtime.**

Modular Intelligent Hubs combine a highly flexible design with a wide variety of modules to meet most Token Ring needs—you can even add an Ethernet segment. You never need to take your network down to install the hot-swappable modules. And built-in redundancy and automatic fault-recovery features ensure reliability.

Chassis—The Modular Intelligent Hub Chassis is easily rackmountable, occupying only 3 U of rack space. It accommodates up to 20 cards, giving you ample space to customize your LAN. You can even choose a Chassis with a management module already installed for added convenience.

Two-Lobe Access Modules—Connect two Token Ring stations over UTP, STP, or single- or multimode fiber.

Four-Lobe Active Access Modules—Available for shielded and unshielded twisted-pair cable, these Modules provide extended distance for up to four Token Ring stations. They also ensure automatic bit detection, and remove stations not operating at 4 or 16 Mbps.

Four-Lobe Passive Access Modules—Provides access for up to four Token Ring stations—without signal regeneration at every lobe. Modules are available for shielded and unshielded twisted-pair cable and coax cable.

Repeaters—Use the Copper Repeater over STP and UTP cable. Use the Fiber repeater with either single- or multimode fiber. Multimode supports distances up to 3 km.

Modules to Connect Adjacent Hubs—The Ring In/Ring Out Module gives you connections over STP and UTP cable as well as cable break protection. The fiber modules give you Ring In/Ring Out connections over single- or multimode fiber cable.

Bridge Modules—Connect the main and the secondary Token Ring LANs by only forwarding frames intended for the other LAN.

Ethernet Modules—The Hub supports an Ethernet segment in addition to the Token Ring. Choose the Module that offers the support your network needs.

In-Band Management Agent Modules—Choose in-band (SNMP) or out-of-band network management capabilities for complete control

Jitter Attenuator—Reduces jitter and regenerates signals for optimal ring performance for up to 260 stations.

Power Supply Module—Use this module to extend the range of non-powered modules.

CHASSIS SPECIFICATIONS

Protocol — Token Ring and Ethernet
CE Approval — All items listed are approved
Connectors — (1) DB25 female (management port); (1) IEC Power
Indicators — LEDs: (2) Power, (2) FLT
Power — 90–260 VAC, 47–63, autosensing,
Size — 5.25"H x 19"W x 9.6"D (13.3 x 48.3 x 24.4 cm)
Weight — 8.3 lb. (3.8 kg)

FAXBACK INFORMATION
Request Document Number: 19242
Call 412-746-5500 Anytime

Item	Code	Price
Modular Intelligent Hub		
Chassis	LT0005A-RR2	**$800.00**
with Network Management Module	LT0005A-RRNM	**$1000.00**
Two-Lobe Access Modules		
Extended Distance		
STP	LT0005A-TEDS	**$225.00**
UTP	LT0005A-TEDU	**$225.00**
Fiber ST® Connector	LT0005A-T2FS	**$700.00**
SMA Connector	LT0005A-T2FSA	**$850.00**
Four-Lobe Active Access Modules		
STP (Dual-Slot)	LT0005A-T4AS	**$600.00**
(Single-Slot)	LT0005A-T4ASD	**$600.00**
UTP	LT0005A-T4AU	**$500.00**
Four-Lobe Passive Access Modules		
Coax	LT0005A-T4CX	**$400.00**
STP (Dual-Slot)	LT0005A-T4S	**$250.00**
(Single-Slot)	LT0005A-T4SD	**$250.00**
UTP (Shielded RJ-45 Connector)	LT0005A-T4SU	**$290.00**
UTP (Unshielded RJ-45 Connector)	LT0005A-T4U	**$250.00**
4/16 Mbps Repeaters		
Copper	LT0005A-TCR	**$800.00**
Fiberoptic with ST Connector	LT0005A-TST	**$1300.00**
Modules to Connect Adjacent Hubs		
Ring-In/Ring-Out Module	LT0005A-TI0	**$200.00**
Fiberoptic Converter		
One-Channel		
SMA Connector	LT0005A-TFC	**$500.00**
ST Connector	LT0005A-T1ST	**$500.00**
Two-Channel		
ST Connector	LT0005A-T2ST	**$800.00**
Token Ring to Coax Converter	LT0005A-TXC	**$60.00**
Token Ring Bridge Modules		
Extender, Two Link—V.35	LT0005A-8D35	**$1850.00**
Local Bridge	LT0005A-MLB	**$1800.00**
to FDDI Bridge	LT0005A-FTB	**$3950.00**
Ethernet Modules		
(4) UTP Ports and (1) AUI Port	LT0005A-EPAUI	**$500.00**
Ethernet Modules (continued)		
without Ethernet Backplane	LT0005A-EPRAUI	**$500.00**
(4) Fiber Ports without Ethernet Backplane	LT0005A-4TFL	**$660.00**
(8) UTP Ports	LT0005A-EP8T	**$380.00**
without Ethernet Backplane	LT0005A-EPR8T	**$600.00**
In-Band Management Agent Modules		
Basic	LT0005A-IB	**$800.00**
Advanced	LT0005A-CMLIB	**$600.00**
Jitter Attenuator	LT0005A-TJA	**$550.00**
Power Supply Module	LT0005A-PS1	**$300.00**
remember to order cables Category 5 Solid Conductor Cable 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95**
For other lengths and pinnings, see p. 68.		
Bulk Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.**
For specific lengths or bulk cable, see pp. 74 and 118.		
Token Ring Adapter Cable, Type 1, 30-ft. (9.1-m),	EVNTRD-0030	**$10.95**
For other lengths, see p. 80.		

Smart Token Ring Access Units

Add Up to Eight Users to Your Token Ring Network.

- **Supports up to eight workstations.**
- **Optional SNMP Network Management.**
- **Optional built-in repeaters for extra distance.**
- **Choose from Type-1 or Type-3 Token Ring.**
- **Only 1 U high to minimize rack space.**
- **Nonpowered—no power outlets required.**

RI
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8
RO
Smart Token Ring Access Unit
BLACK BOX

FAXBACK INFORMATION
Request Document Number: 19266
Call 412-746-5500 Anytime

The Smart Token Ring Access Unit supports up to eight Token Ring connections in a star topology. Add complete Management capabilities simply by installing the Network Management Card.

Optional cable-fault protection isolates a faulty segment from the rest of the LAN.

The Smart Token Ring Access Unit is fully compatible with the IEEE 802.5 and can run at 4 or 16 Mbps. It occupies just 1 U of rack space and, because it's nonpowered, requires no power outlet.

CE Approval — All items listed are approved

Item	Code	Price
Smart Token Ring Access Unit	LT0006A	**$450.00**
Network Management Card	LT0006A-NMC	**$300.00**
Unit and Management Card	LT0006A-TNM	**$750.00**
with Copper Repeaters and Cable Fault Protection	LT0006A-IC16	**$1850.00**
with RJ-45 Ports and Cable Fault Protection	LT0006A-ICOC	**$3110.00**
with Cable Fault Protection	LT0006A-IPNM	**$1150.00**
with RJ-45 Ports	LT0006A-RJNM	**$710.00**
Unit with Cable Fault Protection	LT0006A-IPOP	**$850.00**
with RJ-45 Ports and Cable Fault Protection	LT0006A-IPRJ	**$810.00**
with RJ-45 Ports	LT0006A-RJ	**$410.00**
remember to order cables Type 1 Token Ring Cable, 8-ft. (2.4-m)	EVNTRD9-0008	**$33.95** *For other lengths, see p. 80.*
Category 5 Solid Conductor Cable, 10-ft. (3.0-m), Straight-Pinned	EYN737MS-0010	**$10.95** *For other lengths and pinnings, see p. 68.*

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4/16 Token Ring Fiberoptic Repeaters

Extend the Distance between Your MAUs with Fiber Cable.

- **Extend the distance between MAUs to up to 3 km over multimode cable or 20 km over single-mode cable.**
- **SNMP management.**
- **For multimode or single-mode fiber cable.**
- **Built-in jitter suppression.**
- **Error detection and automatic loopback.**
- **Operates at 4 or 16 Mbps, switch selectable.**

IN
OUT
FLT
TFR 16
PWR
RX
TX
BLACK BOX

When you need to add a ring at a distance—whether across a building or across a campus—the most efficient way to do it is with fiber cable. 4/16 Token Ring Repeaters enable you to extend the distance between MAUs up to 3 km over multimode fiberoptic cable, and up to 20 km over single-mode fiberoptic cable.

Reclocking, reshaping, jitter attenuation, and signal regeneration helps to ensure signal integrity. The Repeaters can locate a cable break and perform an automatic loopback to route the data to a backup path, providing uninterrupted network operation.

These Repeaters operate at 4 or 16 Mbps, detect cable breaks, and perform automatic loopback.

SPECIFICATIONS

Data Rate — 4/16 Mbps, switch selectable
Protocol — Token Ring IEEE 802.5
CE Approval — All items listed are CE approved
Connectors — (1) Data Connector, (1) Fiber ST
Indicators — LEDs: (1) Power, (1) Fault
Power — 115/230 VAC, 47–63 Hz, 5 watt
Size — 1.75"H x 4.3"W x 9.4"D (4.4 x 10.9 x 23.9 cm)
Weight — 2.8 lb. (1.3 kg)

NOTE: Must be used in pairs.

FAXBACK INFORMATION
Request Document Number: 19204
Call 412-746-5500 Anytime

Item	Code	Price
4/16 Token Ring Fiberoptic Repeaters for Single-Mode Cable	LT0008A-1300	**$2000.00**
for Multimode Cable	LT0008A-ST	**$1400.00**
remember to order cables Duplex Fiber Optic Cable, PVC ST-ST	EFN062-CC	**$79.95 + $.70/ft.** *For specific lengths or bulk cable, see pp. 74 and 118.*
Single-Mode Duplex Fiber Optic Cable, PVC ST-ST	EFN5009	**$159.95 + $8.95/m** *For specific lengths or bulk cable, see pp. 76 and 117.*

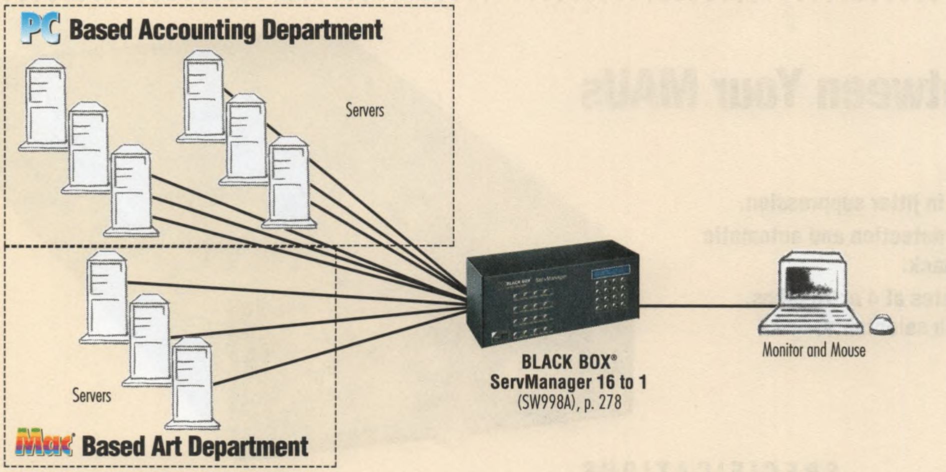
BLACK BOX

BLACK BOX SOLUTION 1

"Accounting uses PCs. The Art Department works on a Mac platform. Is there a ServSwitch to manage both CPU types?"

Yes! You can use the BLACK BOX® ServManager to can control *any combination* of up to 16 PC, Mac®, **and** Sun® CPUs from a single workstation!

ServManager puts cross-platform resource management *at your fingertips.* Configure ports with its 16-key keypad. Switch from the keypad or RS-232 serial port or via keyboard commands. Boot all CPUs at once—even remotely. And you can monitor CPUs at a glance via the Switch's alphanumeric display and front panel.



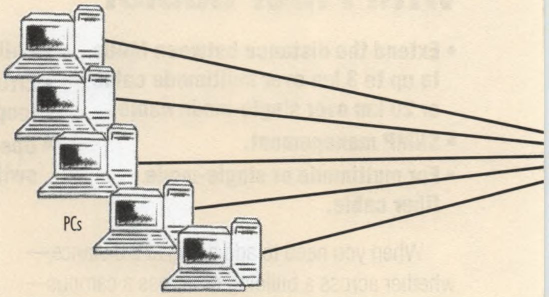
BLACK BOX®
ServManager 16 to 1
(SW998A), p. 278

BLACK BOX SOLUTION 2

"I added a office can we're still at both of

We hear this one all the time.

A company wants more files printed. So it buys a second printer with each printer dedicated to half the office. *But fewer people per printer doesn't necessarily mean fewer waits,* especially if each half of the office has its own "Joe Longfile."



FREE 24-HOUR EXPERT TECH SUPPORT!

Ever have another company sell you on its wonderful tech support? You paid a fortune, right? All for the privilege of being put on hold or getting half-baked answers. What a ripoff!

At Black Box, you're talking to an Expert within 3 to 5 rings—24 hours a day, 7 days a week. Best of all, our Tech Support is FREE! ***No contracts, no obligations, no frustration.***

Call our Technical Experts. Just one call, and we know you'll be sold on us: 412-746-5500.

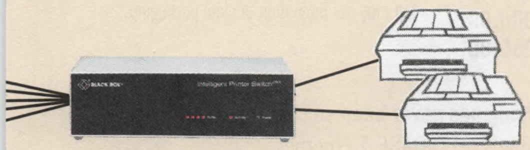
BLACK BOX SOLUTIONS

TO: SHARING & MANAGING RESOURCES

second printer so my output more files. But experiencing long waits our printers. Help!"

Of course, Black Box has the solution—the Intelligent Printer Switch Plus.

With the Printer Switch, up to seven users can share two printers. Users can send files to both printers simultaneously—or to the first printer available. Which means nobody has to wait for Joe Longfile anymore.



Intelligent Printer Switch Plus, 8-Port, 4MB
(PI9141A), p. 307

BLACK BOX SOLUTION 3

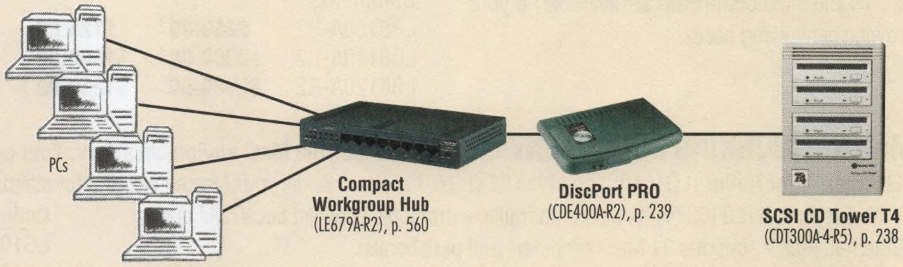
"What's the most efficient way we can access data stored on CD-ROM?"

Well, you could connect a single workstation to a CD-ROM tower via SCSI. But only one person at a time could access the information. And you have an entire workgroup that's *hungry* for data.

Black Box has a better, more efficient way. We can enable everyone in your workgroup to access data stored on CD-ROM right from their own workstations. How? With a Workgroup Hub, DiscPort PRO, and SCSI CD Tower T4.

The Workgroup Hub connects your workgroup to your Ethernet network, and the DiscPort PRO links your network to the CD-ROM Tower. So users can access the *12X* SCSI CD Tower simultaneously— directly from their PCs.

With the Tower, users can access more than one drive at once. They can switch back and forth between drives at the same time others do. And they can even access the same disc at the same time! Now that's efficient data access!



Compact Workgroup Hub
(LE679A-R2), p. 560

DiscPort PRO
(CDE400A-R2), p. 239

SCSI CD Tower T4
(CDT300A-4-R5), p. 238

TECH SUPPORT OUR BEST PRODUCT!

OUR TECHS ANSWER WITHIN 3 TO 5 RINGS, EVERY DAY!

NOW—Same Warranty as Our Standard Products!

The Quality Black Box Products You Want—at FANTASTIC Prices!

ASYNC ROUTER—Instead of leased lines, save with on-demand WAN connections over dialup lines. When the Async Router sees traffic intended for the other side of the link, it automatically dials the line and establishes communication. After a time without traffic, the line is dropped—so you're charged only when the line is in use. It's perfect for remote access to your LAN.

Code	Was	NOW	SAVE!
LRA001A	~~$989.00~~	$595.00	$394.00
LRA001A*	~~$895.00~~	$495.00	$400.00

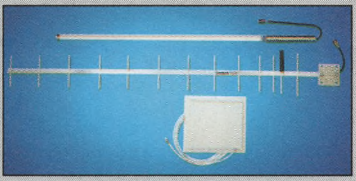
*Class B units look and function like new but may not be in their original packaging.

100-MBPS ETHERNET SWITCH—Interconnect your individual Ethernet LANs with ATM, FDDI, or Fast Ethernet switching. It provides 12 modular-interface ports of switched Ethernet in any combination of BNC, AUI, 10BASE-T, or fiber ports. Hit the throttle, and put your LAN's data in the fast lane!

Code	Was	NOW	SAVE!
LB9600A	~~$5995.00~~	$2095.00	$3900.00

BESTLAN2 ANTENNA KITS—Create a small wireless network for your PS/2® computers, with the LM510C card. To transmit data up to 1000 feet, use two LM521-R2 antennas. For distances up to 3 miles, use two LM520-R2s. For security, order the LM506 encryption chip.

Code	Was	NOW	SAVE!
LM510C	~~$299.00~~	$209.00	$90.00
LM521-R2	~~$115.00~~	$80.00	$35.00
LM520	~~$289.00~~	$239.00	$50.00
LM506	~~$136.00~~	$95.00	$41.00



MINI FOIRL TRANSCEIVER—Connect a thick-coax PC to fiberoptic cable—and at a smart price, too! The Mini FOIRL Transceiver plugs right into your workstation, eliminating the AUI cable. Build a fiberoptic interrepeater link for 2-km distances and greater resistance to EMI. The Mini FOIRL Transceiver is small enough for any workstation.

Code	Was	NOW	SAVE!
LE027A-SMA	~~$136.00~~	$95.00	$41.00

MULTIBRIDGES—This LAN-ready bridge features Novell® IPX™ routing and *more.* You can merge SNA data traffic and integrate toll-free voice/fax traffic—adding FREE voice and fax to your LAN Traffic over just *one* leased line. Four models and three CommPaks are available for your growing networking needs.

Code	Was	NOW	SAVE!
Multibridges			
LB8100A-75	~~$2450.00~~	$1170.00	$1280.00
LB8100A-500	~~$4500.00~~	$2150.00	$2350.00
LB8100A-1000	~~$7700.00~~	$2850.00	$4850.00
LB8100A-2000	~~$9900.00~~	$3750.00	$6150.00
LB8100A-R2*	~~$1925.00~~	$1750.00	$175.00
CommPaks			
LB8150A-R2	~~$250.00~~	$125.00	$125.00
LB8110A-R2	~~$2000.00~~	$1000.00	$1000.00
LB8120A-R2	~~$2500.00~~	$1250.00	$1250.00

*Class B units look and function like new but may not be in their original packaging.

Mac NETWORKING EQUIPMENT—**We've "knifed" the Mac® equipment prices. Your networking has never been so cost-effective!**

- **Ethercard 3 for NuBus** (LG1010C) and **Mac SE** (LG1011C) can handle your Mac networking for standard, Thin, and 10BASE-T Ethernet.
- With **FastPath 5** (LG1027V), you can run multiple protocols between LocalTalk® and Ethernet. Plus it supports 31 Mac computers and peripherals!
- Remote Mac users can tap into a LocalTalk LAN, with the **Remote LocalLink** (LG1042A).
- The **4-Port Remote EtherLink** (LG1044A) provides full Ethernet remote access to 4 users.
- With a pair of **AsyncLinks** (LG1046A) and dialup modems, you can link two LocalTalk LANs.
- Give your Mac II *megabits* of networking speed with a **16/4 Token Ring Card** (LG1100C).
- The **E/L Router/TCP + 10BT** (LG7410A) links one or two LocalTalk LANs to Ethernet.
- Plug the **SCSI Adapter** (LG3013A) into your Mac SCSI interface and connect to Ethernet.
- With the **E/L Flex Router** (LG7500A), you can make up to 4 different types of Ethernet and LocalTalk network connections.
- The **LAN HP/Print Connect** (LE395C) and **LAN HP/Print Connect 10T** (LE399C) enable fast network printing on your HP® LaserJet® II, IID, III, or IIID.

Code	Was	NOW	SAVE!
LG1010C	~~$329.00~~	$99.00	$230.00
LG1011C	~~$329.00~~	$99.00	$230.00
LG1027V	~~$999.00~~	$699.00	$300.00
LG1042A	~~$419.40~~	$295.00	$124.40
LG1044A	~~$999.00~~	$699.00	$300.00
LG1046A	~~$359.00~~	$249.00	$110.00
LG1100C	~~$360.00~~	$249.00	$111.00
LG7410A	~~$1097.50~~	$699.00	$398.50
LG3013A	~~$199.00~~	$139.00	$60.00
LG7500A	~~$999.99~~	$699.00	$300.99
LE395C	~~$249.99~~	$195.00	$54.99
LE399C	~~$595.00~~	$195.00	$400.00

HURRY—WHILE SUPPLIES LAST!

WARRANTY: All of our products have at least a one-year warranty. Our warranty commitment is backed by our guarantee to repair warranty items within one week of receipt. No other discounts apply.

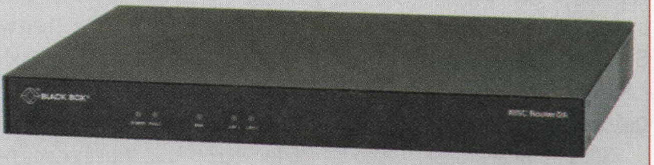
FAXBACK INFORMATION
FaxBacks for All Hot Buys!
Call 412-746-5500 (press 1, 4),
and Request Document Number: 2

TOKEN RING-T1 BRIDGE—Combine your Token Ring LANs and WANs into one integrated network with the Token Ring-T1 Bridge. If you're creating a WAN, you can extend your LAN over phone lines. Plus, you can bridge your Token Ring networks over T1, Fractional T1, 56/64 Kbps, and other leased lines. The Bridge comes with an open module slot that you can use to plug in a Token Ring card or for wide area networking, a T1 bridge card or a 64K bridge card.

Code	Was	NOW	SAVE!
LB1143A	~~$4595.00~~	$995.00	$3600.00

◆ ◆ ◆

ETHERNET BRIDGES—The **RISC Bridge/Router for Ethernet** (LR2001A) features super RISC speed for local bridging and routing. (2) AUI LAN ports. The **ENET WAN Card** (LB501C) for the ISA or EISA slot of your PC provides a DB25 WAN port that's selectable for V.35, RS-422, or RS-232, with speeds to 256 Kbps. The **Ethernet RISC Bridge** (LB600A-R2) features powerful bridge design including SNMP management, Spanning Tree protocol, and an Ethernet switching device configuration. It provides (4) BNC ports for ThinNet and (1) DB25 WAN port.



Code	Was	NOW	SAVE!
LR2001A*	~~$4799.00~~	$2157.00	$2642.00
LB501C	~~$995.00~~	$249.00	$746.00
LB600A-R2	~~$9654.00~~	$2637.00	$7017.00

*Class B units look and function like new but may not be in their original packaging.

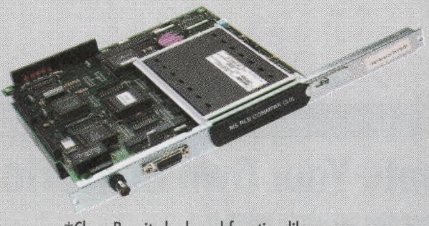
◆ ◆ ◆

MULTISERVERS—Merge voice, data, and LAN traffic onto one line—without loss of data or diminished voice quality. If you already use BLACK BOX® Multiservers, you know what moneysavers they are. Here's your chance to save even more money on select Multiservers and Multiserver modules.

Highlights of this product grouping include:

- MX220A—This Multiserver is ideal for point-to-point applications with limited traffic.
- MX229A—The MS RLB Bridge Module routes LAN traffic through a Multiserver.

Call Tech Support for more product information.



*Class B units look and function like new but may not be in their original packaging.

Code	Was	NOW	SAVE!
MX229A	~~$2485.00~~	$875.00	$1610.00
MX220A*	~~$1500.00~~	$750.00	$750.00
MX218C	~~$250.00~~	$125.00	$125.00
MX219A	~~$1500.00~~	$1250.00	$250.00
MX241A-R3	~~$2500.00~~	$1250.00	$1250.00
MX241A-R2*	~~$2500.00~~	$1250.00	$1250.00
MX410C-422	~~$150.00~~	$127.50	$22.50
MX227C	~~$300.00~~	$150.00	$150.00
MX401A	~~$350.00~~	$175.00	$175.00
MX241A	~~$2500.00~~	$1250.00	$1250.00

◆ ◆ ◆

DATA-CENTER MODEMS—The **Modem 32192 terbo** (MD840A-D12) runs at 19.2 Kbps sync and 115.2 Kbps async, both full duplex. It operates on 12-volt DC power.

Code	Was	NOW	SAVE!
MD840A-D12	~~$1340.00~~	$607.75	$741.25
MD830A*	~~$1125.00~~	$403.00	$722.00
MD833A-R3*	~~$895.00~~	$402.75	$492.25

*Class B units look and function like new but may not be in their original packaging.

The **Modem 20832** (MD830A) V.32 modem is compatible with Bell 208 thanks to an autosensing feature.

Modem 32144 (MD833A-R3) runs at 14.4-Kbps, and has all the features and security you need.

◆ ◆ ◆

TERMINAL SERVERS—Three 16-port Terminal Servers at tremendous savings!

The **Terminal Server/16 SL-TCP** (LE2116A-R2) capability connects up to 16 async devices including terminals, PCs, printers, and modems . Each high-speed port gives you data transfer rates to 57.6 Kbps. Plus, you get full TCP/IP support including RLOGIN, Dynamic SLIP, PPP, BOOTP, TFTP, SNMP, Telnet, and security.

The **Terminal Server/16 SL-LAT/TCP** (LE2216A) provides all the features of the LE2116A-R2 *plus* LAT capability.

The **16-Port Terminal Server LAT/TCP** (LE2216A-R3) provides TCP/IP, LAT, *and* port speeds of up to 115.2 Kbps.

Code	Was	NOW	SAVE!
LE2116A-R2	~~$2599.00~~	$1039.00	$1560.00
LE2216A*	~~$2999.00~~	$1199.00	$1800.00
LE2216A-R3*	~~$2999.00~~	$1170.00	$1829.00

*Class B units look and function like new but may not be in their original packaging.

If You Can't Find It...

We'll meet your one-of-a-kind needs.

For 21 years, Black Box has helped customers around the world solve unique connectivity problems. We can help you, too. We can modify any of our products to suit your one-of-a-kind application. So if you don't see what you need in the Catalog, don't hesitate. Call our Technical Support Experts and ask for it. If we can't find it for you, we'll build it.

Custom design—when off-the-shelf won't do.

Not sure what product will do the job for you? Talk to our technical specialists. We'll work with you to determine what type of product and customization will solve your particular problem. Then our experts will design a product, consult with you on the specifications, and present the final design for your approval.

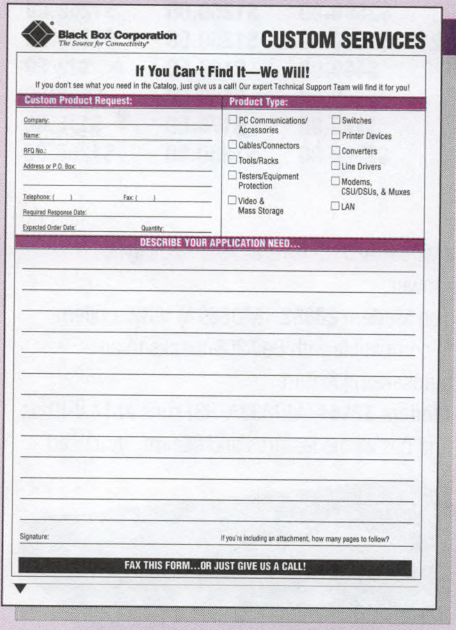
Custom-built, so top quality is assured.

From pinning cables to programming protocol converters, Black Box technical experts can deliver your unique product. We start with standard Black Box components to make sure that your customized product is durable, reliable, and worry-free. Then we make the modifications that you have specified to solve the unique problems at your site.

Cables to switches and everything in between.

Whether you need custom cables, connectors, protocol converters, or switches—we can help. Even when you need a unique product that practically defies classification, count on Black Box. Who knows—your custom product might end up in the Catalog because other customers asked for it, too.

...We Will!



Black Box Corporation
The Source for Connectivity®

CUSTOM SERVICES

If You Can't Find It—We Will!

If you don't see what you need in the Catalog, just give us a call! Our expert Technical Support Team will find it for you!

Custom Product Request:

Company:
Name:
RFQ No.:
Address or P.O. Box:
Telephone: ( ) Fax: ( )
Required Response Date:
Expected Order Date: Quantity:

Product Type:

☐ PC Communications/ Accessories
☐ Cables/Connectors
☐ Tools/Racks
☐ Testers/Equipment Protection
☐ Video & Mass Storage
☐ Switches
☐ Printer Devices
☐ Converters
☐ Line Drivers
☐ Modems, CSU/DSUs, & Muxes
☐ LAN

DESCRIBE YOUR APPLICATION NEED...

Signature: If you're including an attachment, how many pages to follow?

FAX THIS FORM...OR JUST GIVE US A CALL!

Call the BLACK BOX® FaxBack System and request Document Number 12128 to receive your copy of this Custom Services Form.

Custom Products

Create Your Own Converter, Switch, Modem, or...?

You describe it—we'll build it.

Special orders are our specialty. We've built our reputation on them. So tell us what you need. We'll do our best to find a product that meets your specific application. Need a special converter, switch, or some other product? No problem. And the list doesn't stop there. We can customize many products to meet your specs: LAN devices, modems, muxes, line drivers, print sharers, even video products and testers.

It's easy—just call the BLACK BOX® FaxBack System at **412-746-5500** and request our **Custom Services Form** (Document Number 12128) or call to request a copy by mail. Completing this simple form will help you specify and describe the type of equipment you need. Then mail or fax it back to us, along with any attachments that might help in the design.

Once we receive your completed **Custom Services Form**, a Technical Support Specialist will call you with any questions, then provide you with a quote and a delivery date.

Over ***3000*** *Special Orders Filled Each Year!*

Custom Cables

Create Your Own Custom Cable…with Black Box.

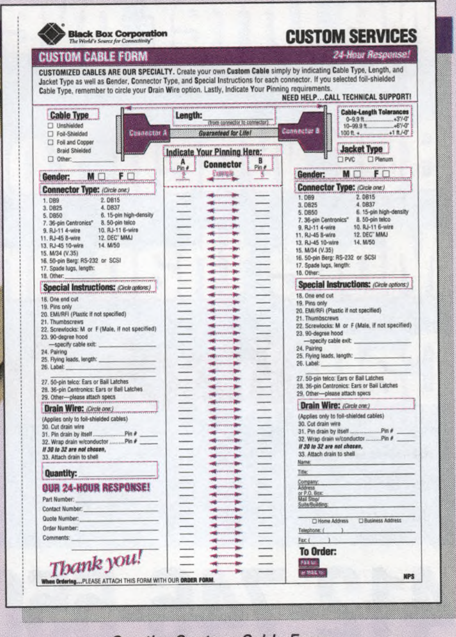
Do we customize cable? Absolutely! In fact, Black Box designs and builds over 150,000 custom cables in a single year. That's a lot of cable—and a lot of experience. Put that experience to work for you.

Need a custom-pinned cable? You've got it. Unusual connector combinations? We can make mixed-connector cables—a DB25 on one end and a DB9 on the other, for example—no trouble at all. Does your installation call for specific lengths not mentioned in the Catalog? Call us. We'll get you the cable you need at the length you want.

You can request cables with all of the following custom options: cable type, length, jacket type, gender, connector type, pinning, shielding, and drain wire options. To help you determine the specifications for your custom cable, fill out the **Custom Cable Form**, **between pages 66 and 67**, or call us for your copy. Then just send us the Form with your order. You can mail it, or for faster service, fax it. The address and fax number are right on the Form.

If you need help filling out the Form, or determining the right specifications for your installation, call our Technical Support staff. One of our Cable Specialists will be glad to help you.

Over
150,000
Custom Cables
Produced Each
Year!



Black Box Corporation
The World's Source for Connectivity™

CUSTOM SERVICES

CUSTOM CABLE FORM *24-Hour Response!*

CUSTOMIZED CABLES ARE OUR SPECIALTY. Create your own **Custom Cable** simply by indicating **C**able **T**ype, **L**ength, and **J**acket **T**ype as well as **G**ender, **C**onnector **T**ype, and **S**pecial **I**nstructions for each connector. If you selected foil-shielded **C**able **T**ype, remember to circle your **D**rain **W**ire option. Lastly, **I**ndicate **Y**our **P**inning requirements.

NEED HELP…CALL TECHNICAL SUPPORT!

Cable Type
☐ Unshielded
☐ Foil-Shielded
☐ Foil and Copper Braid Shielded
☐ Other: ______

Length: ______
(from connector to connector)

Connector A — *Guaranteed for Life!* — Connector B

Cable-Length Tolerances
0–9.9 ft. .... +3"/-0"
10–99.9 ft. .... +6"/-0"
100 ft. + ... +1 ft./-0"

Jacket Type
☐ PVC ☐ Plenum

Indicate Your Pinning Here:

A Pin #	Connector	B Pin #
2	Example ◄──►	5

Gender: M ☐ F ☐

Connector Type: *(Circle one:)*
1. DB9
2. DB15
3. DB25
4. DB37
5. DB50
6. 15-pin high-density
7. 36-pin Centronics®
8. 50-pin telco
9. RJ-11 4-wire
10. RJ-11 6-wire
11. RJ-45 8-wire
12. DEC™ MMJ
13. RJ-45 10-wire
14. M/50
15. M/34 (V.35)
16. 50-pin Berg: RS-232 or SCSI
17. Spade lugs, length:
18. Other: ______

Special Instructions: *(Circle options:)*
18. One end cut
19. Pins only
20. EMI/RFI (Plastic if not specified)
21. Thumbscrews
22. Screwlocks: M or F (Male, if not specified)
23. 90-degree hood
—specify cable exit: ______
24. Pairing
25. Flying leads, length: ______
26. Label: ______
27. 50-pin telco: Ears or Bail Latches
28. 36-pin Centronics: Ears or Bail Latches
29. Other—please attach specs

Drain Wire: *(Circle one:)*
(Applies only to foil-shielded cables)
30. Cut drain wire
31. Pin drain by itself .... Pin # ____
32. Wrap drain w/conductor .... Pin # ____
If 30 to 32 are not chosen,
33. Attach drain to shell

Quantity: ______

OUR 24-HOUR RESPONSE!
Part Number: ______
Contact Number: ______
Quote Number: ______
Order Number: ______
Comments: ______

Thank you!

Gender: M ☐ F ☐

Connector Type: *(Circle one:)*
1. DB9
2. DB15
3. DB25
4. DB37
5. DB50
6. 15-pin high-density
7. 36-pin Centronics®
8. 50-pin telco
9. RJ-11 4-wire
10. RJ-11 6-wire
11. RJ-45 8-wire
12. DEC™ MMJ
13. RJ-45 10-wire
14. M/50
15. M/34 (V.35)
16. 50-pin Berg: RS-232 or SCSI
17. Spade lugs, length:
18. Other: ______

Special Instructions: *(Circle options:)*
18. One end cut
19. Pins only
20. EMI/RFI (Plastic if not specified)
21. Thumbscrews
22. Screwlocks: M or F (Male, if not specified)
23. 90-degree hood
—specify cable exit: ______
24. Pairing
25. Flying leads, length: ______
26. Label: ______
27. 50-pin telco: Ears or Bail Latches
28. 36-pin Centronics: Ears or Bail Latches
29. Other—please attach specs

Drain Wire: *(Circle one:)*
(Applies only to foil-shielded cables)
30. Cut drain wire
31. Pin drain by itself .... Pin # ____
32. Wrap drain w/conductor .... Pin # ____
If 30 to 32 are not chosen,
33. Attach drain to shell

Name: ______
Title: ______
Company: ______
Address or P.O. Box: ______
Mail Stop/ Suite/Building: ______
☐ Home Address ☐ Business Address
Telephone: (   ) ______
Fax: (   ) ______

To Order:
FAX to:
or MAIL to:

NPS

When Ordering…PLEASE ATTACH THIS FORM WITH OUR **ORDER FORM**.

*See the Custom Cable Form, between **pages 66 and 67**.*

FOR *FAST* TECH SUPPORT,
Call **412-746-5500**

PRESS **1,2,2** CONNECTIVITY

Printer Devices, **Cables/Connectors**, Switches, Tools/Racks, Equipment Protection/Testers

For the right Tech Support Team for your needs, look for these helpful instructions throughout the *BLACK BOX® Catalog!*

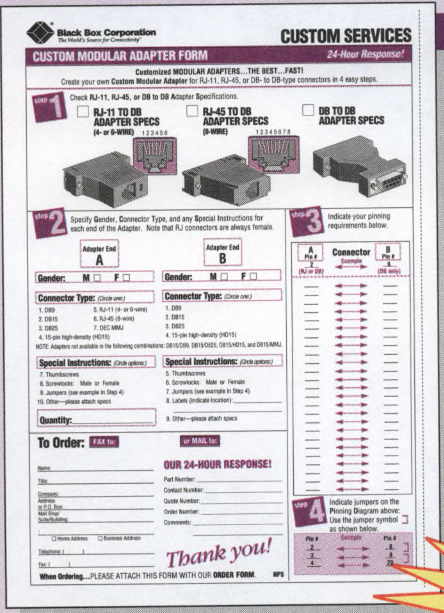
Custom Modular Adapters

Customize Your Own Modular Adapters.

Sometimes custom modular adapters are all you may need for your installation. Count on Black Box. You'll get the best customized modular adapters—fast.

Black Box can customize adapters to meet your application—RJ-11 to DB-type, RJ-45 to DB-type, or DB-type to DB-type. *You* specify the type of connector, gender, special pinning, jumpers, even labeling options. To help you determine the specifications for your custom modular adapters, turn to the **Custom Modular Adapter Form between pages 66 and 67**, or call us for your copy. Filling out the Form will help you determine exactly what you need. Then just send us the Form with your order. You can either mail it, or for faster service, fax it. The numbers and address are right on the Form.

If you need help filling out the Form or determining the right specifications for your installation, just call Technical Support. One of our experts will be glad to help you.



Black Box Corporation
The World's Source for Connectivity™

CUSTOM SERVICES

CUSTOM MODULAR ADAPTER FORM *24-Hour Response!*

Customized MODULAR ADAPTERS…THE BEST…FAST!
Create your own **Custom Modular Adapter** for RJ-11, RJ-45, or DB- to DB-type connectors in 4 easy steps.

step 1 Check **RJ-11, RJ-45, or DB to DB A**dapter **S**pecifications.
☐ **RJ-11 TO DB ADAPTER SPECS (4- or 6-WIRE)** 1 2 3 4 5 6
☐ **RJ-45 TO DB ADAPTER SPECS (8-WIRE)** 1 2 3 4 5 6 7 8
☐ **DB TO DB ADAPTER SPECS**

step 2 Specify **G**ender, **C**onnector **T**ype, and any **S**pecial **I**nstructions for each end of the Adapter. Note that RJ connectors are always female.

Adapter End A

Gender: M ☐ F ☐

Connector Type: *(Circle one:)*
1. DB9
2. DB15
3. DB25
4. 15-pin high-density (HD15)
5. RJ-11 (4- or 6-wire)
6. RJ-45 (8-wire)
7. DEC MMJ

Adapter End B

Gender: M ☐ F ☐

Connector Type: *(Circle one:)*
1. DB9
2. DB15
3. DB25
4. 15-pin high-density (HD15)

NOTE: Adapters not available in the following combinations: DB15/DB9, DB15/DB25, DB15/HD15, and DB15/MMJ.

Special Instructions: *(Circle options:)*
7. Thumbscrews
8. Screwlocks: Male or Female
9. Jumpers (see example in Step 4)
10. Other—please attach specs

Quantity: ______

Special Instructions: *(Circle options:)*
5. Thumbscrews
6. Screwlocks: Male or Female
7. Jumpers (see example in Step 4)
8. Labels (indicate location): ______
9. Other—please attach specs

step 3 Indicate your pinning requirements below.

A Pin #	Connector	B Pin #
2 (RJ or DB)	Example ◄──►	6 (DB only)

step 4 Indicate jumpers on the **P**inning **D**iagram above: Use the jumper symbol] as shown below.

Pin #	Example	Pin #
2	◄──►	6
3	◄──►	8
4	◄──►	20

To Order: FAX to: or MAIL to:

Name: ______
Title: ______
Company: ______
Address or P.O. Box: ______
Mail Stop/ Suite/Building: ______
☐ Home Address ☐ Business Address
Telephone: (   ) ______
Fax: (   ) ______

OUR 24-HOUR RESPONSE!
Part Number: ______
Contact Number: ______
Quote Number: ______
Order Number: ______
Comments: ______

Thank you!

When Ordering…PLEASE ATTACH THIS FORM WITH OUR **ORDER FORM**. NPS

*See the Custom Modular Adapter Form, between **pages 66 and 67**.*

Over
25,000
Custom Modular
Adapters Produced
Each Year!

PLUS! If you don't see what you need in this Catalog, just give us a call. Our expert Technical Support Team will find it for you!

To find out more, call 412-746-5500 today!

We Offer over 7000 Solutions *Every* Day.

But When You're Looking for More than an Everyday Solution, Call **Black Box Custom Services.**

412-746-5500

Sure, we offer **over 7000** products *every* day. But when you're looking for more than an everyday solution, you don't have to climb mountains or go to the ends of the earth. Just call Black Box and we'll find it for you.

For 21 years, **Black Box Custom Services** has helped customers solve their unique connectivity problems. We've modified many of our products: cables, adapters, modems, switches—*you name it!*

Custom Services puts our Technical Support experts on the trail of your custom solution. They'll work with you to determine what type of product and customization best suits your needs. And after consulting with you on the specifications, our Techs will find exactly what you need.

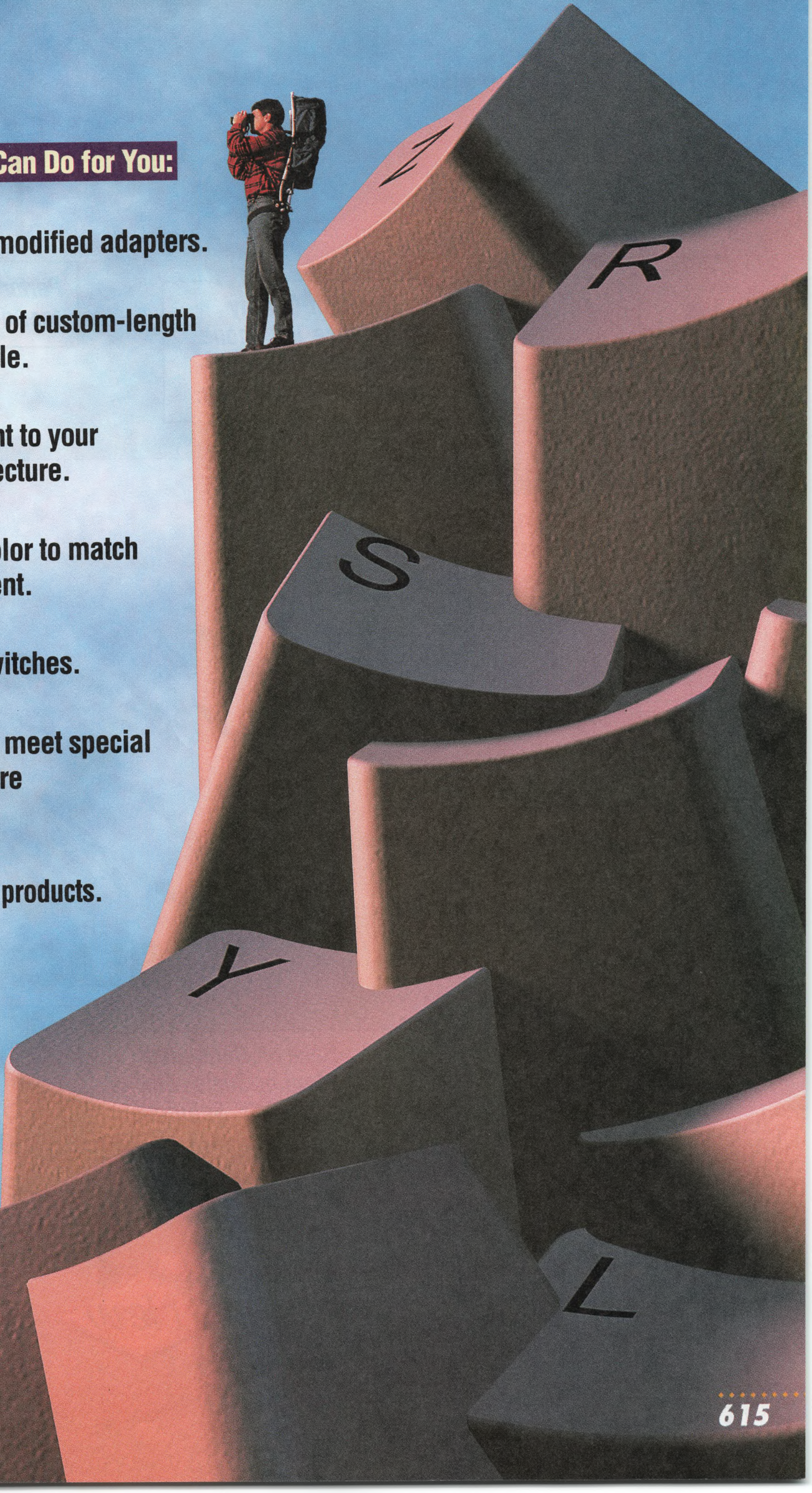
So if you're looking for custom cables or switches or anything else in between, **Black Box Custom Services** puts those products in sight—*and in your hands!*

MORE! Custom Services Info, **pages 612–613.**

Look to Black Box for All Your Special Orders!

What Custom Services Can Do for You:

- Produce hundreds of modified adapters.
- Manufacture all kinds of custom-length or custom-pinned cable.
- Modify LAN equipment to your unique system architecture.
- Change equipment color to match your office environment.
- Modify standalone switches.
- Provide products that meet special power and temperature requirements.
- Locate “hard-to-find” products.
- Custom labeling.
- All this and much more—call us!



Look for the ConferenceLink™ CS1050
on page 52.

The High-Quality Conference Telephone that Beats All Speakerphones—Hands Down.

APC
AMERICAN POWER CONVERSION

See the Smart-UPS®
on page 176.

Performance Power Management for Advanced Business Networks.

Space-Saving ServRacks Organize Your Equipment.

For our ServRacks,
turn to page 164.

Customers' Choice

BLACK BOX

Give Each Member of Your Crew a Scanner. The MicroScanner Does a Lot for Less.

MICROSCANNER
BLACK BOX

Check out the
MicroScanner™
on page 198.

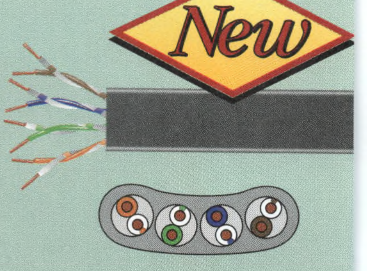
Save on Unneeded Monitor Costs with ServSwitch™ Solutions.

BLACK BOX® ServSwitch™ technology
BLACK BOX
RESET
ServSwitch Jr.
New

Find the ServSwitch Jr.
on page 276.

70% of Network Downtime Is Cable-Related. Don't Skimp!

Don't miss our
350-MHz
Belden
MediaTwist™
Cables on
page 114.



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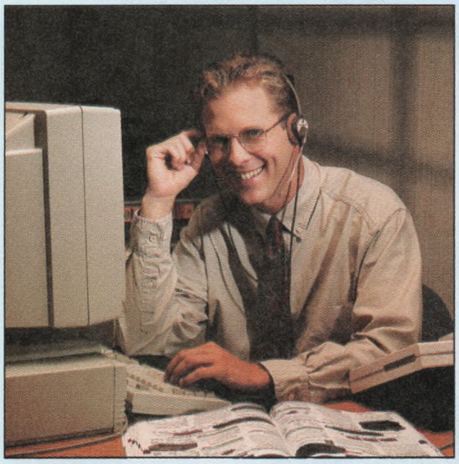

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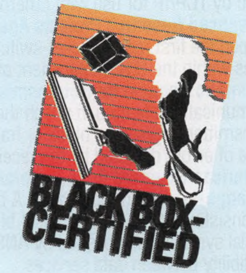

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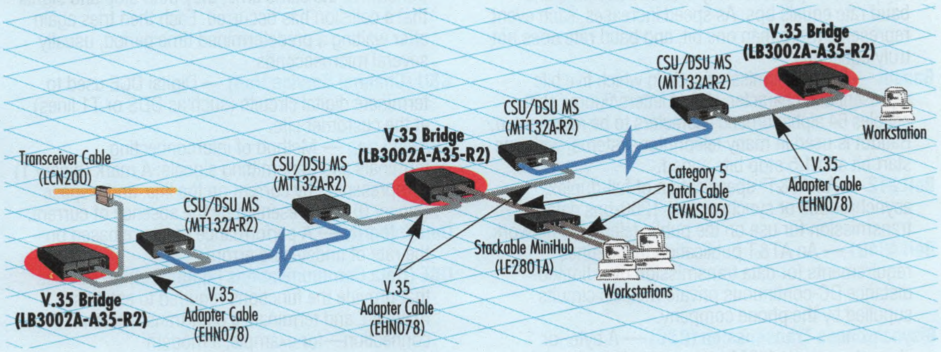

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CSU/DSU MS (MT132A-R2)
Stackable MiniHub (LE2801A)
Workstations
V.35 Bridge (LB3002A-A35-R2)
V.35 Adapter Cable (EHN078)
V.35 Adapter Cable (EHN078)

Glossary

Active/Passive Devices — In current-loop applications, a device capable of supplying the current for the loop is active and a device that must draw its current from connected equipment is passive.

Address — Unique designation for the location of data or the identity of an intelligent device; each device on a communications line can respond to its own message.

Analog — A transmission mode in which data is represented by a continuously varying electrical signal. Compare with ***digital***.

ANSI (American National Standards Institute) — The principal standards development body in the U.S. ANSI is a nonprofit, nongovernmental body supported by trade organizations, professional societies, and industry. It is the U.S.'s member body to the ISO (International Standards Organization).

API (Application Program Interface) — A set of formalized software calls and routines that can be referenced by an application program to access underlying network services.

APPC (Advanced Peer-to-Peer Communications) — A network architecture definition by IBM® specified as featuring high-level program interaction capabilities on a peer-to-peer basis.

AppleTalk® — A proprietary computer networking standard from Apple® Computer for use in connecting Macintosh® computers and other peripherals, particularly LaserWriter® printers; operates at 230 Kbps.

Application Layer — The highest layer of the seven-layer OSI model structure; with all user or application programs; in the IBM SNA, it's the end-user layer.

ARP (Address Resolution Protocol) — A Transmission Control Protocol/Internet Protocol (TCP/IP) process that maps IP addresses to Ethernet addresses; required by TCP/IP for use with Ethernet.

ARPA (Advanced Research Projects Agency) — Developed the first major packet-switched network; operates within the U.S. Department of Defense.

ARQ (Automatic Request for Retransmission) — A communications feature in which the receiver asks the transmitter to resend a block or frame, generally because of errors detected by the receiver.

ASCII (American Standard Code for Information Interchange) — Pronounced *asky*. A binary data code consisting of 7 data bits plus 1 bit for parity or special symbols; established by ANSI for compatibility between data services.

Asynchronous Transmission — Transmission in which time intervals between transmitted characters may be of unequal length. Transmission is controlled by start and stop bits at the beginning and end of each character. Compare with ***synchronous transmission***.

Bandwidth — The range of frequencies available for signaling; the difference between the highest and lowest frequencies of a band, measured in Hertz.

Baud — Unit of signaling speed. The speed in baud is the number of line changes (in frequency, amplitude, etc.) or events per second. At low speeds each event represents only one bit condition, and baud rate equals bps. As speed increases, each event represents more than one bit, and baud rate does not truly equal bps.

Baudot — Data-transmission code in which five bits represent one character. Use of letters/figures shift enables 64 alphanumeric characters to be represented. Baudot is used in many teleprinter systems, with one start bit and 1.5 stop bits added.

Bell 212 — An AT&T® specification of full-duplex, asynchronous or synchronous, 1200-bps data transmission for use on the public telephone network.

Bell 43401 — An AT&T publication that defines requirements for data transmission over limited-distance DC-continuous private metallic circuits supplied by the phone company.

Bisynchronous Transmission (BSC) — A byte- or character-oriented IBM communications protocol that has become an industry standard. It uses a defined set of control characters for synchronized transmission of binary-coded data between stations in a data-communications system.

Bit (Binary Digit) — The smallest unit of information in a binary system; a one or zero condition.

Bit Error Rate Testing/Block Error Rate Testing (BERT/BLERT) — An error-checking technique that compares a received data pattern with a known transmitted data pattern to determine transmission-line quality.

Broadband — A communications channel that has greater bandwidth than a voice-grade line and is potentially capable of greater transmission rates.

Buffer — A temporary-storage device used to compensate for a difference in data rate and data flow between two devices (typically a computer and a printer); also called a spooler.

Byte — A unit of information, usually shorter than a computer "word." Eight-bit bytes are most common. Also called a "character."

CCITT (Comité Consultatif Internationale de Télégraphique et Téléphonique) — An international association that sets worldwide communications standards (such as V.21, V.22, and X.25). Replaced by the ITU-TSS.

Central Office — The building in which common carriers terminate customer circuits (also known as Central Exchange).

Clamping Voltages — The predefined voltage level at which a clamping circuit will activate.

Clock — Shorthand term for the source(s) of timing signals used in synchronous transmission. More generally, the source(s) of timing signals sequencing electronic events.

Common Carrier — A private utility company that furnishes communications services to the general public.

Composite Link — The line or circuit connecting a pair of multiplexors or concentrators; the circuit carrying multiplexed data.

Conditioning — The addition of equipment to a leased voice-grade channel, enabling the channel to meet specifications for data transmission.

Contention — The facility provided by the dial network or a data PABX which enables multiple terminals to compete on a first-come, first-served basis for a smaller number of computer ports.

CRC — Cyclic Redundancy Check; a basic error-checking mechanism for link-level data transmissions; a characteristic link-level feature of (typically) bit-oriented data-communications protocols. The data integrity of a received frame or packet is checked via a polynomial algorithm based on the content of the frame, and then matched with the result that is performed by the sender and included in a field (most often a 16-bit field) appended to the frame.

Crossed Pinning — Cable configuration that enables two DTE devices or two DCE devices to communicate.

Crossover — Conductor which runs through the cable and connects to a different pin number at each end.

CSMA/CD (Carrier Sense Multiple Access/Collision Detection) — A local area network access method in which contention between two or more stations is resolved by collision detection. When two stations transmit at the same time, they both stop and signal that a collision has occurred. Each then tries again after waiting a predetermined time period, usually several microseconds.

CSU (Channel Service Unit) — Digital DCE used to terminate digital circuits (such as DDS or T1 lines) at the customer site.

Current Loop — Method of interconnecting terminals and transmitting signals: A mark (binary 1) is represented by current on the line, and a space (binary 0) is represented by the absence of current.

Data Integrity — A performance measure based on the rate of undetected errors.

DCE (Data Communications Equipment) — Devices that provide the functions required to establish, maintain, and terminate a data-transmission connection—for example, a modem.

DDS (Dataphone® Digital Service) — An AT&T communications service in which data is transmitted in digital rather than analog form.

Digital — Transmission in which data is encoded as either a binary one (1) or zero (0). Compare with ***analog***.

DSR (Data Set Ready) — An RS-232 modem interface control signal that indicates the terminal is ready for transmission.

DSU (Digital Service Unit) — The interface between a user's data terminal device (DTE) and a digital data service, usually via a ***CSU***.

DTE (Data Terminal Equipment) — Devices acting as data source, data sink, or both.

DTMF (Dual-Tone Multiple-Frequency) — The audio signaling frequency on touchtone, pushbutton phones.

EBCDIC (Extended Binary Coded Decimal Interchange Code) — An 8-bit character code used primarily in IBM equipment, allowing for 256 different bit patterns.

EIA (Electronic Industries Association) — A standards organization in the U.S. specializing in the electrical and functional characteristics of interface equipment.

EIA-485 — The recommended standard of the Electronic Industries Association that specifies the electrical characteristics of generators and receivers for use in balanced digital multipoint systems.

EMI/RFI (Electromagnetic Interference/Radio Frequency Interference) Filtering — Protection from "background noise" that could alter or destroy data transmission.

Emulation — The imitation of all or part of a computer system, performed by a hardware/software combo, that enables incompatible systems to work together.

EPROM (Erasable Programmable Read-Only Memory) — A nonvolatile semiconductor PROM that can be erased by exposing it to intense ultraviolet light for reuse.

Even Parity — A "dumb" terminal data-verification method in which each character must have an even number of "1" bits.

FCC (Federal Communications Commission) — Regulates all telecommunications originating in the U.S. including transmission over phone lines.

Firmware — A computer program or software stored permanently in PROM or ROM or semipermanently in EPROM.

Flow Control — The procedure for regulating the flow of data between two devices; prevents the loss of data once a device's buffer has reached its capacity.

Frame Relay — Packet-switched network similar to X.25, but with end-to-end error-checking and high-speed transmission rates.

Frequency-Division Multiplexor (FDM) — A device that divides the available transmission frequency range into narrower banks, each of which is used for a separate channel.

Front-End Processor (FEP) — A computer designed for communications control of a mainframe.

Full-Duplex (FDX) — Simultaneous, two-way, independent transmission in both directions.

Half-Duplex (HDX) — Transmission in either direction, but not simultaneously.

Handshaking — Exchange of predetermined signals between two devices establishing a connection. Usually part of a communications protocol.

HDLC (High-Level Data Link Control) — The international standard communication protocol defined by the ISO.

IEEE (Institute of Electrical and Electronic Engineers) — An international professional society that issues its own standards and is a member of ANSI and ISO.

Interface — A shared boundary defined by common physical interconnection characteristics, signal characteristics, and meanings of interchanged signals.

ISO — International Standards Organization.

ISDN — Integrated Services Digital Network. A circuit comprised of two 64-Kbps bearer (B) channels and one 16-Kbps data (D) channel that's used for signaling. The two B channels can be combined to provide up to 128 Kbps of throughput via a dialup network.

ITU-TSS (International Telegraphic Union Telecommunications Standards Sector) — The replacement organization for the CCITT.

Leased Line — A telephone line reserved for the exclusive use of leasing customers, without interexchange switching arrangements. Also called a Private Line.

LED (Light-Emitting Diode) — A semiconductor light source that converts electrical signals to visible light or invisible infrared radiation.

Glossary

Line Driver — A DCE device that amplifies a data signal for transmission over cable for distances beyond the RS-232 limit of 50 feet, even up to several miles. Also called "limited-distance modem" (LDM) or "short-haul modem" (SHM).

Line Turnaround — The reversing of transmission direction when a half-duplex circuit is used.

Link Layer — Layer Two of the OSI reference model; also known as the Data-Link Layer.

LLC (Logical Link Control) — A protocol developed by the IEEE 802 committee for data-link-level transmission control; the upper sublayer of the IEEE Layer 2 (OSI) protocol that complements the MAC protocol; IEEE Standard 802.2; includes end-system addressing and error-checking.

Loaded Line — A telephone line equipped with loading coils; adds inductance to minimize amplitude distortion.

Local Area Network (LAN) — A data-communications system confined to a limited geographic area (up to 6 miles or about 10 kilometers) with moderate to high data rates (100 Kbps to 50 Mbps). The area served may consist of a single building, a cluster of buildings, or a campus-type arrangement. The network uses some type of switching technology, and does not use common carrier circuits (although it may have gateways or bridges to other public or private networks).

Local Line, Local Loop — A channel connecting the subscriber's equipment to the line-terminating equipment in the central office. Usually a metallic circuit (either 2-wire or 4-wire).

Loopback — Type of diagnostic test in which the transmitted signal is returned to the sending device after passing through all or part of a data-communications link or network. A loopback test permits the comparison of a returned signal with the transmitted signal.

LU 6.2 — In Systems Network Architecture, a set of protocols that provides peer-to-peer communications between applications.

MAC (Media Access Control) — A media-specific access-control protocol within IEEE 802 specifications; currently includes variations for Token Ring, token bus, and CSMA/CD; the lower sublayer of the IEEE's link layer (OSI), complementing the Logical Link Control (LLC).

Mainframe — A large-scale computer system that can house comprehensive software and several peripherals.

Manchester Encoding — Digital encoding technique specified for the IEEE 802.3 Ethernet baseband network standard. Each bit period is divided into complementary halves; a negative-to-positive (voltage) transition in the middle of the bit period designates a binary "1," while a positive-to-negative transition represents a "0." The encoding technique also enables the receiving device to recover the transmitted clock from the incoming data stream (self-clocking).

MAP (Manufacturing Automation Protocol) — A suite of networking protocols originated by General Motors®; it tracks the seven layers of the OSI model.

Mark — Presence of signal. In telegraphy, a mark represents the closed condition or current flowing. A mark impulse is equivalent to a binary 1.

Modem (Modulator-Demodulator) — A device used to convert serial digital data from a transmitting terminal to an analog signal for transmission over a telephone channel, or to reconvert the transmitted analog signal to serial digital data for acceptance by a receiving terminal.

Modem Eliminator — A device used to connect a local terminal and a computer port instead of the pair of modems they would ordinarily need; enables DTE-to-DTE data and control signal connections otherwise not easily achieved by standard cables or connectors.

Multiplexor — A device that divides a transmission facility into two or more subchannels, either by splitting the frequency band into narrower bands (frequency division) or by allotting a common channel to several transmitting devices, one at a time (time division).

Multipoint Line — A single communications line or circuit interconnecting several stations; usually requires some kind of polling mechanism to address each connected terminal with a unique address code.

Network — An interconnected group of nodes; a series of points, nodes, or stations connected by communications channels; the assembly of equipment through which connections are made between data stations.

Network Architecture — A set of design principles, including the organization of functions and the description of data formats and procedures; the basis for the design and implementation of a network (ISO).

Network Layer — Layer 3 in the OSI model; the logical network entity that services the transport layer; responsible for ensuring that data passed to it from the transport layer is routed and delivered through the network.

Network Topology — The physical and logical relationship of nodes in a network; the schematic arrangement of the links and nodes of a network; networks typically have a star, ring, tree, or bus topology, or some combination.

Node — A point of interconnection to a network. Normally, a point at which a number of terminals or tail circuits attach to the network.

NRZ (Non-Return-to-Zero) — Binary coding transmission with no return to neutral state after each bit is transmitted.

Null Modem — A device that connects two DTEs directly by emulating the physical connections of a DCE.

Packet — A group of bits (including data and call control signals) transmitted as a whole on a packet-switching network. Usually smaller than a transmission block.

PAD (Packet Assembler-Disassembler) — An interface between a terminal or computer and a packet-switching network.

Parallel Transmission — Transmission mode that sends a number of bits simultaneously over separate lines (for example, 8 bits over 8 lines). Usually unidirectional.

Parity Bit — A bit that is set at "0" or "1" in a character to ensure that the total number of 1 bits in the data field is even or odd, as desired.

Parity Check — The addition of noninformation bits to make up a transmission block that ensures the total number of 1s as always either even (even parity) or odd (odd parity); used to detect transmission errors.

Phase Modulation — One of three ways of modifying a sine-wave signal to make it "carry" information. The sine wave or "carrier" has its phase changed in accordance with the information to be transmitted.

Point-to-Point (Link) — A connection between two, and only two, pieces of equipment.

Polling — A communications technique that determines when a terminal is ready to send data. The computer continually interrogates all of its attached terminals in a round-robin sequence. A terminal acknowledges the poll when it has data to send.

PROM (Programmable Read-Only Memory) — A nonvolatile memory chip that stores data or program permanently. Compare with ***volatile memory***.

Protocol — A formal set of conventions governing the formatting and relative timing of message exchange between two communicating systems.

Public Switched Telephone Network (PSTN) — Any switching communications system—such as Telex, TWX, or public telephone networks—that provides circuit switching to many customers.

RAM (Random-Access Memory) — Semiconductor read/write volatile memory. Data stored is lost if power is turned off.

Response Time — (1) The elapsed time between the end of a message and the beginning of the reply; it includes terminal delay and network delay; (2) how fast a surge protector responds to block power surges; also called "clamp time."

ROM (Read-Only Memory) — Memory chips that store data or software.

RS-232 — EIA interface standard between DTE and DCE, employing serial binary data interchange. The industry's most common interface standard.

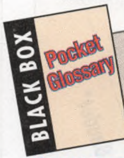
RS-422, RS-423 — EIA interface standard that extends transmission speeds and distances beyond RS-232. RS-422 is a balanced-voltage system with a high level of noise immunity; RS-423 is the unbalanced version.

RS-449 — EIA general-purpose 37-pin and 9-pin interface for DCE and DCE, employing serial binary data interchange.

RS-485 — Balanced interface similar to RS-422 but using tri-state drivers for multidrop applications.

RS-530 — Similar to RS-449 in that it describes a mechanical connector, RS-530 uses a DB25 connector and supports RS-422, RS-423, RS-485, and V.35 electrical interfaces.

SDLC (Synchronous Data Link Control) — IBM® standard protocol, superseding ***bisynchronous (BSC)***.



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Serial Transmission — The most common transmission mode: information bits are sent sequentially on a single data channel.

Shielding — Protective cable covering that eliminates electromagnetic and radio frequency interference.

Short-Haul Modem — See ***Line Driver***.

Space — Absence of signal. In telegraph communications, a space represents the open condition or no current flowing. A space impulse is equivalent to a binary 0.

Statistical Multiplexing — A multiplexing technique: Bandwidth is dynamically allocated on the basis of need.

String — A process consisting of a series of threads.

STX (Start of Text) — A control character used to indicate the beginning of a message; it immediately follows the header in transmission blocks.

Surge — An oversupply of voltage from the power company, lasting as long as several seconds. A strong surge can damage electronic equipment.

Switched Line — A communications link for which the physical path may vary with each usage, such as the public telephone network.

Synchronous Transmission — Transmission in which data bits are sent at a fixed rate, with the transmitter and receiver synchronized. Synchronized transmission eliminates the need for start and stop bits. Compare with ***asynchronous transmission***.

Time-Division Multiplexing (TDM) — Transmitting multiple channels on a single transmission line by connecting terminals, one at a time, at regular intervals, interleaving bits (Bit TDM) or characters (Character TDM) from each terminal.

Time-Sharing — A method of computer operation that enables several interactive terminals to use one computer. Although the terminals are actually served in sequence, the high speed of the computer makes it appear as if all terminals were being served simultaneously.

Transient — An abrupt change in voltage, of short duration—for example, a brief pulse caused by the operation of a switch; also called a spike.

Tree — A LAN topology that recognizes only one route between two nodes on the network. The map resembles a tree or the letter "T."

Trunk — A dedicated aggregate telephone circuit connect-ing two switching centers, central offices, or data-concentration devices. Also, the main network cable.

V.35 — ITU standard governing data transmission at 48 Kbps over 60- to 108-KHz group band circuits.

Voice-Grade Line — A channel that is capable of carrying voice-frequency signals.

Volatile Memory — A storage medium that loses all data when power is removed. Compare with ***PROM***.

X.21 — ITU standard governing interface between DTE and DCE for synchronous operation on public data networks.

X.25 — ITU standard governing interface between DTE and DCE for terminals operating in the packet mode on public data networks.

X.25 PAD — A device that permits communication between non-X.25 devices and the devices in an X.25 network. See ***PAD***.

X-ON/X-OFF (Transmitter On/Transmitter Off) — Control characters used for flow control, instructing a terminal to start transmission (X-ON) and end transmission (X-OFF).

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HEXADECIMAL EQUIVALENCY

		HEX						
Character or Control	**Decimal**	**Mark Parity ASCII**	**Space Parity ASCII**	**Even Parity ASCII**	**Odd Parity ASCII**	**EBCDIC**	**6-Bit Transcode**	**Baudot***
A	65	C1	41	41	C1	C1	01	1F 03
B	66	C2	42	42	C2	C2	02	1F 19
C	67	C3	43	C3	43	C3	03	1F 0E
D	68	C4	44	44	C4	C4	04	1F 09
E	69	C5	45	C5	45	C5	05	1F 01
F	70	C6	46	C6	46	C6	06	1F 0D
G	71	C7	47	47	C7	C7	07	1F 1A
H	72	C8	48	48	C8	C8	08	1F 14
I	73	C9	49	C9	49	C9	09	1F 06
J	74	CA	4A	CA	4A	D1	11	1F 0B
K	75	CB	4B	4B	CB	D2	12	1F 0F
L	76	CC	4C	CC	4C	D3	13	1F 12
M	77	CD	4D	4D	CD	D4	14	1F 1C
N	78	CE	4E	4E	CE	D5	15	1F 0C
O	79	CF	4F	CF	4F	D6	16	1F 18
P	80	D0	50	50	D0	D7	17	1F 16
Q	81	D1	51	D1	51	D8	18	1F 17
R	82	D2	52	D2	52	D9	19	1F 0A
S	83	D3	53	53	D3	E2	22	1F 05
T	84	D4	54	D4	54	E3	23	1F 10
U	85	D5	55	55	D5	E4	24	1F 07
V	86	D6	56	56	D6	E5	25	1F 1E
W	87	D7	57	D7	57	E6	26	1F 13
X	88	D8	58	D8	58	E7	27	1F 1D
Y	89	D9	59	59	D9	E8	28	1F 15
Z	90	DA	5A	5A	DA	E9	29	1F 11
a	97	E1	61	E1	61	81		
b	98	E2	62	E2	62	82		
c	99	E3	63	63	E3	83		
d	100	E4	64	E4	64	84		
e	101	E5	65	65	E5	85		
f	102	E6	66	66	E6	86		
g	103	E7	67	E7	67	87		
h	104	E8	68	E8	68	88		
i	105	E9	69	69	E9	89		
j	106	EA	6A	6A	EA	91		
k	107	EB	6B	EB	6B	92		
l	108	EC	6C	6C	EC	93		
m	109	ED	6D	ED	6D	94		
n	110	EE	6E	EE	6E	95		
o	111	EF	6F	6F	EF	96		
p	112	F0	70	F0	70	97		
q	113	F1	71	71	F1	98		
r	114	F2	72	72	F2	99		
s	115	F3	73	F3	73	A2		
t	116	F4	74	74	F4	A3		
u	117	F5	75	F5	75	A4		
v	118	F6	76	F6	76	A5		
w	119	F7	77	77	F7	A6		
x	120	F8	78	78	F8	A7		
y	121	F9	79	F9	79	A8		
z	122	FA	7A	FA	7A	A9		

		HEX						
Character or Control	**Decimal**	**Mark Parity ASCII**	**Space Parity ASCII**	**Even Parity ASCII**	**Odd Parity ASCII**	**EBCDIC**	**6-Bit Transcode**	**Baudot***
0	48	B0	30	30	B0	F0	30	1B 16
1	49	B1	31	B1	31	F1	31	1B 17
2	50	B2	32	B2	32	F2	32	1B 13
3	51	B3	33	33	B3	F3	33	1B 01
4	52	B4	34	B4	34	F4	34	1B 0A
5	53	B5	35	35	B5	F5	35	1B 10
6	54	B6	36	36	B6	F6	36	1B 15
7	55	B7	37	B7	37	F7	37	1B 07
8	56	B8	38	B8	38	F8	38	1B 06
9	57	B9	39	39	B9	F9	39	1B 18
SP	32	A0	20	A0	20	40	1A	04
!	33	A1	21	21	A1	5A		
"	34	A2	22	22	A2	7F		1B 11
#	35	A3	23	A3	23	7B	3B	1B 14
$	36	A4	24	24	A4	5B	1B	1B 0D
%	37	A5	25	A5	25	6C	2C	
&	38	A6	26	A6	26	50	10	1B 1A
'	39	A7	27	27	A7	7D		1B 05
(	40	A8	28	28	A8	4D		1B 0F
)	41	A9	29	A9	29	5D		1B 12
*****	42	AA	2A	AA	2A	5C	1C	
+	43	AB	2B	2B	AB	4E		1B 09
,	44	AC	2C	AC	2C	6B	2B	1B 0C
-	45	AD	2D	2D	AD	60	20	1B 03
.	46	AE	2E	2E	AE	4B	0B	1B 1C
/	47	AF	2F	AF	2F	61	21	1B 1D
:	58	BA	3A	3A	BA	7A		1B 0E
;	59	BB	3B	BB	3B	5E		1B 1E
<	60	BC	3C	3C	BC	4C	0C	
=	61	BD	3D	BD	3D	7E		
>	62	BE	3E	BE	3E	6E		
?	63	BF	3F	3F	BF	6F		1B 19
@	64	C0	40	C0	40	7C	3C	
[	91	DB	5B	DB	5B			
\	92	DC	5C	5C	DC	E0		
]	93	DD	5D	DD	5D			
^	94	DE	5E	DE	5E			
—	95	DF	5F	5F	DF	6D		
`	96	E0	60	60	E0			
{	123	FB	7B	7B	FB	C0		
|	124	FC	7C	FC	7C	6A		
}	125	FD	7D	7D	FD	D0		
~	126	FE	7E	7E	FE	A1		
¢						4A		
¬						5F		
ACK	6	86	06	06	86	2E		
BEL	7	87	07	87	07	2F	0D	1B 0B
BS	8	88	08	88	08	16		
BYP						24		
CAN	24	98	18	18	98	18		
CC						1A		
CR	13	8D	0D	8D	0D	0D		08

		HEX						
Character or Control	**Decimal**	**Mark Parity ASCII**	**Space Parity ASCII**	**Even Parity ASCII**	**Odd Parity ASCII**	**EBCDIC**	**6-Bit Transcode**	**Baudot***
DC1	17	91	11	11	91	11		
DC2	18	92	12	12	92	12		
DC3	19	93	13	93	13	13		
DC4	20	94	14	14	94	3C		
DEL	127	FF	7F	FF	7F	07	3F	
DLE	16	90	10	90	10	10	1F	
DS						20		
EM	25	99	19	99	19	19	3E	
ENQ	5	85	05	05	85	2D	2D	
EOB						26		
EOT	4	84	04	84	04	37	1E	
ESC	27	9B	1B	1B	9B	27	2A	
ETB	23	97	17	17	97	26	0F	
ETX	3	83	03	03	83	03	2E	
FF	12	8C	0C	0C	8C	0C		
FIG							1B	
FS	28	9C	1C	9C	1C	22		
GS	29	9D	1D	1D	9D			
HT	9	89	09	09	89	05	2F	
IFS						1C		
IGS						1G		
IL						17		
IRS						1E		
IUS						1F		
LC						06		
LET								1F
LF	10	8A	0A	0A	8A	25		02
NAK	21	95	15	95	15	3D	3D	
NL						15		
NUL	0	80	00	00	80	00		
PF						04		
PN						34		
PRE						27		
RES						14		
RLF						09		
RS	30	9E	1E	1E	9E	35		
SI	15	8F	0F	0F	8F	0F		
SM						2A		
SMM						0A		
SO	14	8E	0E	8E	0E	0E		
SOH	1	81	01	81	01	01	00	
SOS						21		
STX	2	82	02	82	02	02	0A	
SUB	26	9A	1A	9A	1A	3F	0E	
SYN	22	96	16	96	16	32	3A	
UC						36		
US	31	9F	1F	9F	1F		1D	
VT	11	8B	0B	8B	0B	0B		

* *The Baudot listing may be in the form of two hex numbers, in which case the first number designates the LETTERS/FIGURES SHIFT. Where only one hex number is shown, the character is shift-independent.*

In This Section...
Glossary
Hexadecimal Chart
Serial Data Transmission
Modem Standards

Black Box Explains...

Serial Data Transmission.

Serial data transmission is the most common method of sending data from one DTE to another. Data is sent out in a stream, one bit at a time, over one channel.

When a computer is instructed to send data to another DTE, the data within the computer must pass through a serial interface to exit as serial data. Then it passes through the ports, cables, and connectors that link the various devices. The boundaries (physical, functional, and electrical) shared by these devices are called interfaces.

RS-232 — Defines three types of connections: electrical, functional, and mechanical. The most commonly used interface, RS-232 is ideal for the data-transmission range of 0–20 Kbps/50 ft. (15.2 m). It employs unbalanced signaling and is usually used with 25-pin D-shaped connectors (DB25) to interconnect DTEs (computers, controllers, etc.) and DCEs (modems, converters, etc.). Serial data exits through an RS-232 port via the Transmit Data (TD) lead and arrives at the destination device's RS-232 port through its Receive Data (RD) lead. RS-232 is compatible with these standards: ITU V.24, V.28; ISO IS2110.

RS-449 — Defines functional/mechanical interfaces for DTEs/DCEs that employ serial binary data interchange and is usually used with synchronous transmissions. It identifies signals (TD, RD, etc.) that correspond with the pin numbers for a balanced interface on DB37 and DB9 connectors. RS-449 was originally intended to replace RS-232, but RS-232 and RS-449 are completely incompatible in mechanical and electrical specifications.

RS-530 — Supersedes RS-449 and complements RS-232. Based on a 25-pin connection, it works in conjunction with either electrical interface RS-422 (balanced electrical circuits) or RS-423 (unbalanced electrical circuits). RS-530 defines the mechanical/electrical interfaces between DTEs and DCEs that transmit serial binary data, whether synchronous or asynchronous. RS-530 provides a means for taking advantage of higher data rates with the same mechanical connector used for RS-232. However, RS-530 and RS-232 are not compatible!

RS-530 accommodates data-transmission rates from 20 Kbps to 2 Mbps; maximum distance depends on which electrical interface is used. RS-530 is compatible with these standards: ITU V.10, V.11, X.26; MIL-188/114; RS-449.

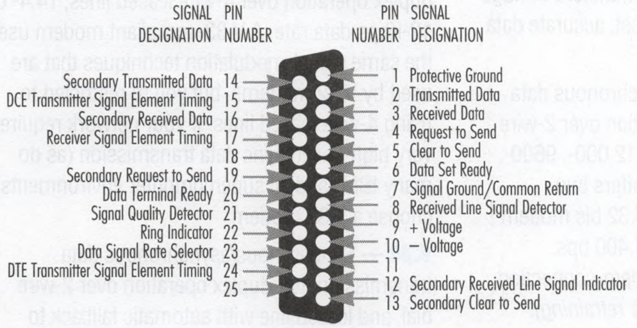
RS-422 — Defines a balanced interface with no accompanying physical connector. Manufacturers who adhere to this standard use many different connectors, including screw terminals, DB9, DB25 with nonstandard pinning, DB25 following RS-530, and DB37 following RS-449. RS-422 is commonly used in point-to-point communications conducted with a dual-state driver. Transmissions can run long distances at high speeds.

RS-485 — Resembles RS-422 except that associated drivers are tri-state, not dual-state. It may be used in multipoint applications where one computer controls many different devices. Up to 64 devices may be interconnected with RS-485.

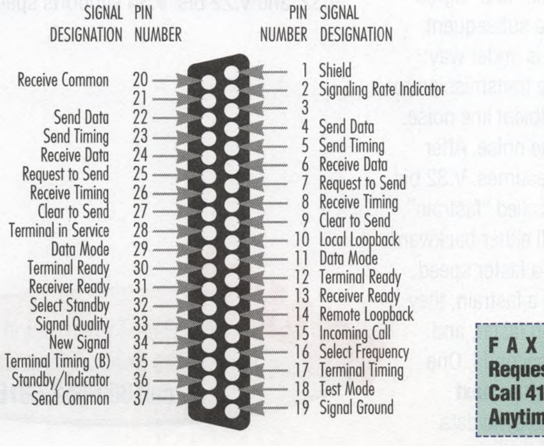
V.35 — Is the international standard termed "Data Transmission at 48 Kbps Using 60–108 KHz Group-Band Circuits." It is typically used for DTEs or DCEs that interface to a high-speed digital carrier such as AT&T® Dataphone® Digital Service (DDS).

NOTE: ITU (International Telegraphic Union) was formerly the CCITT.

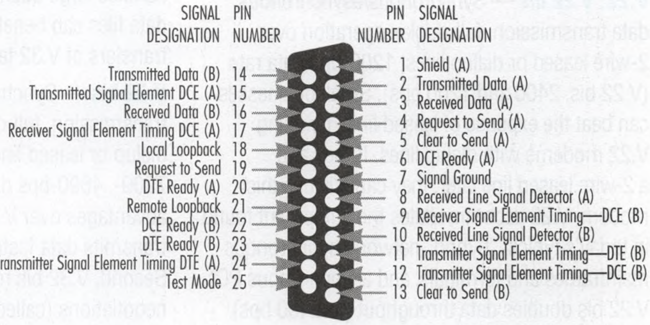
RS-232 INTERFACE


SIGNAL DESIGNATION
PIN NUMBER
Secondary Transmitted Data 14
DCE Transmitter Signal Element Timing 15
Secondary Received Data 16
Receiver Signal Element Timing 17
18
Secondary Request to Send 19
Data Terminal Ready 20
Signal Quality Detector 21
Ring Indicator 22
Data Signal Rate Selector 23
DTE Transmitter Signal Element Timing 24
25
PIN NUMBER
SIGNAL DESIGNATION
1 Protective Ground
2 Transmitted Data
3 Received Data
4 Request to Send
5 Clear to Send
6 Data Set Ready
7 Signal Ground/Common Return
8 Received Line Signal Detector
9 + Voltage
10 – Voltage
11
12 Secondary Received Line Signal Indicator
13 Secondary Clear to Send

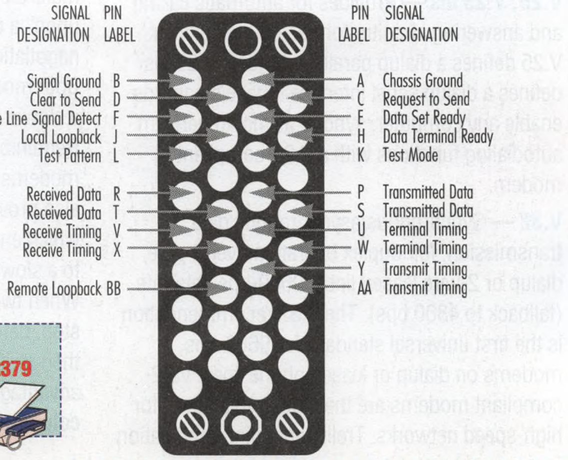
RS-449 INTERFACE


SIGNAL DESIGNATION
PIN NUMBER
Receive Common 20
21
Send Data 22
Send Timing 23
Receive Data 24
Request to Send 25
Receive Timing 26
Clear to Send 27
Terminal in Service 28
Data Mode 29
Terminal Ready 30
Receiver Ready 31
Select Standby 32
Signal Quality 33
New Signal 34
Terminal Timing (B) 35
Standby/Indicator 36
Send Common 37
PIN NUMBER
SIGNAL DESIGNATION
1 Shield
2 Signaling Rate Indicator
3
4 Send Data
5 Send Timing
6 Receive Data
7 Request to Send
8 Receive Timing
9 Clear to Send
10 Local Loopback
11 Data Mode
12 Terminal Ready
13 Receiver Ready
14 Remote Loopback
15 Incoming Call
16 Select Frequency
17 Terminal Timing
18 Test Mode
19 Signal Ground

RS-530 INTERFACE


SIGNAL DESIGNATION
PIN NUMBER
Transmitted Data (B) 14
Transmitted Signal Element DCE (A) 15
Received Data (B) 16
Receiver Signal Element Timing DCE (A) 17
Local Loopback 18
Request to Send 19
DTE Ready (A) 20
Remote Loopback 21
DCE Ready (B) 22
DTE Ready (B) 23
Transmitter Signal Element Timing DTE (A) 24
Test Mode 25
PIN NUMBER
SIGNAL DESIGNATION
1 Shield (A)
2 Transmitted Data (A)
3 Received Data (A)
4 Request to Send (A)
5 Clear to Send (A)
6 DCE Ready (A)
7 Signal Ground
8 Received Line Signal Detector (A)
9 Receiver Signal Element Timing—DCE (B)
10 Received Line Signal Detector (B)
11 Transmitter Signal Element Timing—DTE (B)
12 Transmitter Signal Element Timing—DCE (B)
13 Clear to Send (B)

V.35 INTERFACE


SIGNAL DESIGNATION
PIN LABEL
Signal Ground B
Clear to Send D
Receive Line Signal Detect F
Local Loopback J
Test Pattern L
Received Data R
Received Data T
Receive Timing V
Receive Timing X
Remote Loopback BB
PIN LABEL
SIGNAL DESIGNATION
A Chassis Ground
C Request to Send
E Data Set Ready
H Data Terminal Ready
K Test Mode
P Transmitted Data
S Transmitted Data
U Terminal Timing
W Terminal Timing
Y Transmit Timing
AA Transmit Timing

FAXBACK INFO
Request Document Number: 12379
Call 412-746-5500
Anytime

Black Box Explains...

x2 Technology.

The increase in complex graphical content on Web sites has slowed the downloading process. But x2™ Technology, developed by U.S. Robotics®, substantially speeds up the delivery of information.

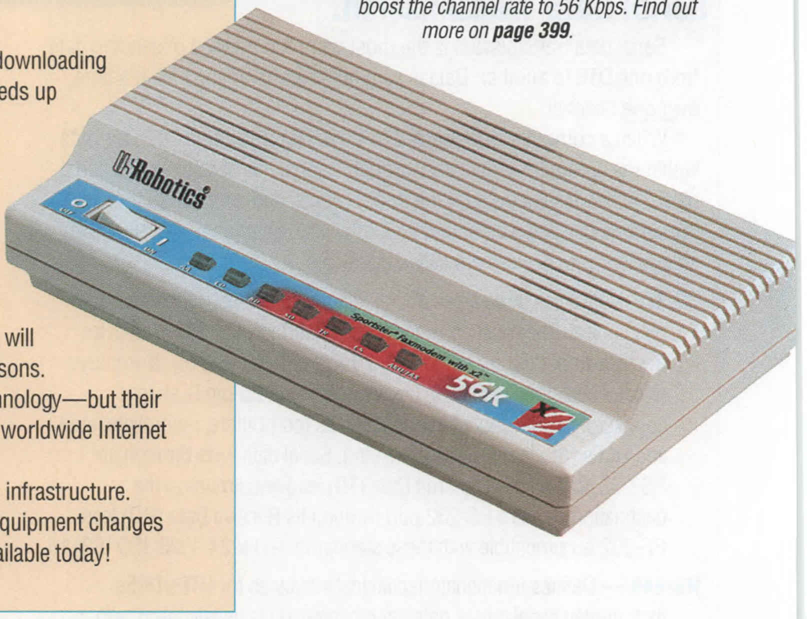
x2 Technology is asymmetrical which means speeds for sending and receiving data are different. A digital-encoding transmission technique enables a 56-Kbps channel to be established for downloading files. The analog-to-digital conversion in the "downstream" path is bypassed and nearly all of the available 64-Kbps network bandwidth can be used.

A study released in October 1996 predicted that 50 percent of online households will be using x2 or other 56-Kbps modems by 1998. But only x2 will be *the* cost-effective communication option for several years. Why? Two reasons.

First, other vendors are forging ahead with their proprietary 56-Kbps technology—but their standards are still in development. x2 is ready here and now—and over 200 worldwide Internet service providers and online services are signed up to support it.

Second, x2 is based upon existing technology in the telecommunications infrastructure. Other emerging high-speed technologies such as ADSL require substantial equipment changes by telephone companies—changes which may take years to install. x2 is available today!

V.34 is the latest and fastest ITU-ratified V. specification, offering a top dialup rate of 28.8 Kbps. However, our new Sportster® Modem 56K uses x2™ Technology to boost the channel rate to 56 Kbps. Find out more on ***page 399****.*



ITU V.XX Modem Standards.

The International Telegraphic Union (ITU) is an international association that establishes worldwide communication standards. Its standards are prefaced by the letter "V" and include the following:

V.22, V.22 bis — Synchronous/asynchronous data transmission, full-duplex operation over 2-wire leased or dialup lines; 1200-bps data rate (V.22 bis, 2400 and 1200 bps). Small businesses can beat the expense of leased lines by using V.22 modems with dialup lines. If they add a 2-wire leased line later, they can still use this modem. V.22 accommodates the equipment found in today's typical "hybrid" network: synchronous mainframes and terminals, and asynchronous PCs. V.22 bis doubles data throughput (to 2400 bps) for quick service of large file transfers.

V.25, V.25 bis — Provides for automatic calling and answering circuitry for use on dialup lines. V.25 defines a dialup parallel interface; V.25 bis defines a dialup serial interface. These standards enable any computer, sync or async, to perform autodialing functions with a V.25-compliant modem.

V.32 — Synchronous/asynchronous data transmission, full-duplex operation over 2-wire dialup or 2-wire leased lines; 9600-bps data rate (fallback to 4800 bps). The V.32 recommendation is the first universal standard for 9600-bps modems on dialup or leased phone lines. V.32-compliant modems are the industry standard for high-speed networks. Trellis-encoding modulation enables high data speeds and reduces errors. Data can be sent over standard dialup lines—which are a lot less expensive to use than leased lines. And V.32-compliant modems will work anywhere in the world. Any business, large or small, that handles large quantities of data transfers or huge data files can benefit from the fast, accurate data transfers of V.32 technology.

V.32 bis — Synchronous/asynchronous data transmission, full-duplex operation over 2-wire dialup or leased lines; 14,400-, 12,000-, 9600-, 7200-, 4800-bps data rates. It offers two advantages over V.32. First, a V.32 bis modem transmits data faster—up to 14,400 bps. Second, V.32 bis redefines modem-connection negotiations (called *training* and *retraining*). *Training* is the procedure two modems use to make a connection; they "discuss" and "agree upon" a data rate. *Retraining* is a subsequent negotiation after data exchange is under way: Both modems "agree" to reduce transmission to a slower speed to overcome ambient line noise. Retraining is triggered by the line noise. After modems retrain, data transfer resumes. V.32 bis also provides a new procedure called "fastrain", which enables the modem to fall either backward to a slower speed or forward to a faster speed. When two V.32 bis modems do a fastrain, they stop, determine that they can run faster, and then switch speed in a few milliseconds. One advantage of V.32 bis over V.33 (see **next column**): with V.33 you can send sync data at 14.4 Kbps over a 4-wire leased line, but with V.32 bis, you can do the same over a 2-wire dialup line—much less expensive to use than a leased line.

V.33 — Synchronous data transmission, full-duplex operation over 4-wire leased lines, 14.4- or 12-Kbps data rate. A V.33-compliant modem uses the same signal-modulation techniques that are used by V.32 modems, but you're restricted to using 4-wire leased lines. If your network requires very high-speed sync data transmission (as do many IBM® and all supercomputer environments), choose a V.33 modem.

V.34 — Synchronous/asynchronous data transmission, full-duplex operation over 2-wire dial, and leased line with automatic fallback to compatible lower modems such as V.32 bis, V.32, and V.22 bis. V.34 supports speeds

PLUS!
Free Data-Transmission Guide, see the Subscription Cards or call 800-552-6816.

Bell Standards.

In the 1960s and 1970s, Bell Labs created carrier standards for use with Bell equipment and lines to accommodate customers' fledgling networks.

Today, a vast installed base of Bell Standard customers relies heavily on these modems. Black Box stocks a complete line of Bell Standard Modems. Bell Standards include the following:

Bell 103 — Asynchronous data transmission, full-duplex operation over 2-wire dialup or leased lines; 300-bps data rate. Ideal for the "low-demand" user who exchanges files infrequently with another PC user or an online bulletin board. Comparable to ITU V.21.

Bell 201 B, Bell 201 C — 201 B: Synchronous data transmission, full-duplex operation over 4-wire leased lines and half-duplex operation over 2-wire leased lines; 2400-bps data rate. 201 C: synchronous data transmission, half-duplex operation over 2-wire dialup lines; 2400-bps data rate. Both are comparable to ITU V.26. Bell 201 B compatible modems are the first of the fast modems. Many businesses still use them in typical terminal-to-host, multidrop applications. Bell 201 C modems are for use with dialup lines and are basically a complement to the 201 B. If you need to transmit synchronous data (for example, IBM® 3780/2780 applications) at 2400 bps, but you don't need the on-demand performance and cost of a leased line, then consider buying a Bell 201 C.

Bell 208 A, Bell 208 B — 208 A: Synchronous data transmission, full-duplex operation over 4-wire leased lines, half-duplex operation over 2-wire leased lines; 4800-bps data rate. 208 B: same as 208 A, but over 2-wire dialup lines. Comparable to ITU V.27. The first standards to enable higher-speed data transmission (4800 bps) over leased lines for multipoint networks. For example, these standards enable users to connect IBM mainframes at a central office to terminals in branch offices, with fewer modems and more efficient in-house cable runs.

Bell 212 A — Synchronous/asynchronous data transmission, full-duplex operation over 2-wire leased or dialup lines; 1200-bps data rate. This versatile standard provides for efficient full-duplex operation over 2-wire dialup lines. This is a big advantage for small businesses that need to avoid the expense of leased lines. If you add a leased line, however, you can still use Bell 212A. Comparable to ITU V.22.

Depend on Black Box for reliable, Bell-Standard modems like the Modem 201 BC/AS, on ***page 409****.*

BLACK BOX
(412) 746-5500
201BC/AS
MR/RI
TR
RS
CS
CD
RD
TD
TM
DATA
AL
LDL
RDL
RDLST
TALK
TTP
RTP
ST
POWER

Protocols for Error Correction and Data Compression.

Error correction and data compression ensure accurate, swift data transfers. The protocols are employed during the data exchange between two modems. The following protocols are the most widely used by today's modems:

MNP Levels 1–4 — Microcom Networking Protocol® (MNP®), developed by Microcom Systems, Inc., enables error-free async data transmission. Although MNP is proprietary, it became an industry standard in the 1980s because users demanded it from manufacturers. Both modems in a connection must use the same MNP protocols.

MNP Level 5 — Incorporates the first four levels and also applies a data-compression algorithm. It "compresses" data 2:1. So you can double the amount of data you can send at the modem's top transmission speed. For example, modems that transmit data at 4800 bps would send, with MNP Level 5, an amount of data equal to an uncompressed 9600 bps.

V.42, V.42 bis — These "V Series" protocols are internationally recognized standards for error control and data compression. V.42 is the recommendation of the ITU for error control; it contains two algorithms (LAPM, or Link Access Protocol, and MNP 1–4). When two V.42-compliant modems establish a connection, they use LAPM to control data errors and retransmit "bad" data blocks. If one modem supports V.42 and the other supports only MNP, then the two negotiate to use MNP protocol. In both cases, the error-control process is automatic and requires no special user actions or software programs. V.42 bis roughly corresponds to MNP Level 5. The difference is the amount of data compressed: V.42 can usually generate a 4:1 ratio of data compression, depending on the type of file transmitted.

For a modem with MNP Level 5, full V.34 compliance, a 50-password memory, and security, see Modem 3400 on ***page 408****.*

V.34
BLACK BOX
(412) 746-5500
YES
NO
TALK/DATA
108
106
105
109
104
103
TR
CS
RS
CD
RD
TD

What is ISDN?

Integrated Services Digital Network (ISDN) is a high-speed digital data service typically provided by your telephone company. With ISDN you can transmit large amounts of data, voice, and video signals over a single telephone line at higher speeds—***and lower cost***—than with any other digital service or analog modem.

Typical ISDN Applications

ISDN is ***the perfect choice*** for any number of high-volume datacomm applications where faster data rates, lower prices, and guaranteed data integrity are required:

- Internet Access and Online Service
- Telecommuting
- Remote Office Routing
- Videoconferencing
- PC-to-PC Screen-Sharing and Collaboration
- Disaster Recovery

Also consider ISDN service when you need...

- Datacomm service to more than one location.
- Datacomm lines for just a few hours a day.
- Simultaneous voice and data communications.
- A high-speed backup line.

Is ISDN Affordable?

Absolutely! In fact, tariffed rates are ***still falling!*** And with ISDN already available throughout more than 70% of the U.S., strong growth and continued tumbling prices are expected well into the next century. Compare the costs of ISDN and other high-speed services using the chart **below**.

Three Main Reasons to Consider ISDN:

1. ISDN is a switched service. That means data connections are temporary and the ISDN link is active only when you use it. The benefit: After a small monthly fee, you pay only for ISDN calls you make. Dedicated high-speed services such as T1 charge a high monthly rate even if you don't use them.
2. ISDN supports flexible connections to multiple sites. Just like a regular telephone line, ISDN lets you dial any ISDN location—anywhere in the world! Services like DDS or T1 provide a fixed point-to-point connection with no flexibility to dial other locations. ISDN gives you fast, flexible communications for a much lower price!
3. All-digital transmission means high performance. High-speed analog modems can suffer data slowdowns because of poor telephone line quality. Since ISDN is an end-to-end digital service, you always have the full bandwidth available for data transmission.

Some Background Information about ISDN...

There are three kinds of ISDN service: Basic Rate Interface (BRI), Primary Rate Interface (PRI), and Multirate. PRI and Multirate service are typically used by large facilities to support high-bandwidth applications such as PBX phone systems. These services are more expensive and therefore less widely available than BRI sevice.

The most common (and least-expensive) ISDN service is BRI. Its most usual application is combining voice and data circuits over one line between small-scale ISDN sites.

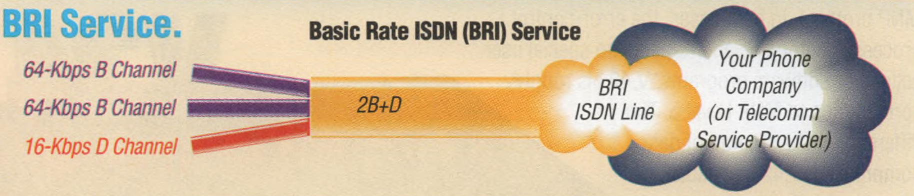
ISDN COST-COMPARISON CHART

Service	Speed	Monthly Charge	Per Minute Charge	Total Monthly Cost (Average 3 hours per day)
Leased 56 DDS	56 Kbps	$900.00	$0.00	$900.00
Dialup Modem (depending on modem type and line quality)	Up to 28.8 Kbps	$18.00	$0.20	$810.00
Switched 56 DDS	56 Kbps	$60.00	$0.10	$456.00
ISDN Line (1B+D)	**64 Kbps**	**$38.00**	**$0.05**	**$236.00**
ISDN Line (2B+D)	**128 Kbps**	**$38.00**	**$0.10**	**$434.00**

This chart shows costs for a data connection over 50 miles (80 km), within the same area code. These rates are for comparison only and may vary. Contact your local telephone company for actual rates.

Black Box Explains...

BRI Service.


Basic Rate ISDN (BRI) Service
64-Kbps B Channel
64-Kbps B Channel
16-Kbps D Channel
2B+D
BRI ISDN Line
Your Phone Company (or Telecomm Service Provider)

A single BRI line can accommodate up to 128 Kbps over two virtual 64-Kbps Bearer (B) channels. Each B channel can transmit digital data and fax signals simultaneously, along with digitized voice and video traffic. A single 16-Kbps Delta (D) channel is allocated to support system "overhead" functions such as signaling the telecomm switching system to initiate a call. The illustration **above** shows the data capacity of a BRI ISDN line (also referred to as a 2B+D line).

What makes ISDN unique is that each B channel is a separate communication circuit. That means that just one ISDN line can support simultaneous two-way communication for two devices, such as a computer and a telephone, or a computer and a video camera for teleconferencing.

Additionally, if you need to send more data than one 64-Kbps B channel can handle, ISDN also supports the de facto **BONDING** standard for **inverse multiplexing**. This links the two B channels into a single logical circuit that can support data rates up to 128 Kbps. In fact, using ISDN multiplexors, you can now merge multiple ISDN lines for maximum data rates as high as *512 Kbps!*

ISDN Glossary.

B Channel—Bearer channel which transmits actual voice or data traffic. Each B channel can run at speeds up to 64 Kbps.

D Channel—Delta channel running at 16 Kbps. It's used to support overhead functions of ISDN such as signaling between user sites and the telco service company.

Basic Rate Interface (BRI)—The most-commonly used ISDN line configuration. Combines two 64-Kbps B data channels with one 16-Kbps D overhead channel. BRI lines combine voice and data over a single service line.

2B+D—Common abbreviation for a Basic Rate Interface ISDN line. Stands for two B channels plus one D channel.

BONDING—An industry-standard protocol for "Bandwidth ON Demand." BONDING uses the technique of inverse multiplexing to link the two B channels of a single ISDN line to form one high-speed circuit capable of running at 128 Kbps.

NT-1—A device that converts the phone company's (2-wire) ISDN U interface to a (4-wire) S/T interface for compatibility with customer-site terminal adapters.

SPID (Service Profile IDentifier)—A number issued by the telephone company central office that identifies terminal equipment attached to the ISDN line.

S/T Interface—Refers to the 4-wire interface of a terminal adapter.

Terminal Adapters—ISDN customer premise equipment (CPE) that allows non-ISDN CPE, such as a phone or PC, to attach to ISDN.

U Interface—The 2-wire ISDN interface from the local exchange that's terminated at the ISDN customer's site.

Black Box Explains...

What Is PCMCIA?

The Personal Computer Memory Card International Association (PCMCIA) is a nonprofit standards organization chartered with establishing, marketing, and maintaining standards for credit-card-sized, integrated-circuit PC cards. These types of cards are now being called "PC Cards" to reflect the fact that they aren't used only as memory cards.

INSERT THIS END
SPORTSTER
33.6K PC Card Modem
U.S.Robotics
UPGRADEABLE
Megahertz

These U.S. Robotics® PC Cards fit both slot Type II and Type III. Find them on **page 399** *of this Catalog.*

The Benefits of PCMCIA Cards

- Small size.
- Easy, plug-in insertion.
- High performance.
- Host independence.
- Execute-in-Place (XIP) technology.
- Hot-swappable.

PCMCIA Standards

The PCMCIA standard specifies a removable device measuring 2.126" x 3.37" (5.4 x 8.6 cm). Basically that's the size of three stacked credit cards. PCMCIA Cards have 68 pin assignments, and interface with both 8- and 16-bit buses. They also support physical access of up to 64 MB of memory.

PCMCIA cards give you universal expansion capability for mobile computers and can support a variety of functions including wireline- and radio-based fax and modem capabilities, mass storage, and memory extension for host machines.

PCMCIA Releases

PCMCIA Release 1.0, issued in September 1990, covered memory requirements for mobile computing. Release 2.0 was issued in September 1991 and specified capabilities within the standard for modem, LAN, cellular, radio-frequency, and other I/O peripherals. Release 2.0 is backward-compatible: Cards that conform to Release 1.0 will operate in card slots that conform to Release 2.0.

The current PCMCIA standard Release 2.0 also corresponds to the standards of JEIDA (Japanese Electronic Industry Association/Joint Electronic Device Engineer Council) and ISO (International Standards Organization).

PCMCIA Slots

There are three types of PCMCIA slots and a fourth one is coming soon. These slots are identified by the thickness of the card that fits in them. All types are backward-compatible.

Type I Cards are 3.3 mm thick. They're used primarily in Personal Digital Assistants (PDAs) and handheld devices as RAM, FLASH memory, electrically erasable, programmable read-only memory (EEPROM), and one-time programmable memory (OTP).

Type II Cards are 5 mm thick and are fully I/O-capable. You can use them for memory enhancements or for I/O features in modems, LAN connections, and host communications.

Type III Cards measure 10.5 mm thick. They're designed primarily for removable hard drives and radio communication devices that require a larger size. They can also be used for memory enhancements.

Type IV Cards have not yet been ratified by the PCMCIA consortium. The exact size is expected to be 18 mm thick. Type IV cards will be used for large-capacity hard drives.

How Does PCMCIA Work?

The PCMCIA standard defines six fundamental hardware and software standards: for the card itself (see **above right**), the socket/adapter interface, Socket Services, Card Services, the Card Information Structure (CIS), and the system software.

The PCMCIA card is plugged into a host socket/adapter on the computer's motherboard or connected to its expansion bus. The socket side has the standard 68-pin interface for the card. The adapter side translates the PCMCIA interface signals to match the computer's bus standards.

Socket Services is the software interface between the card in the socket and the adapter to the computer's bus. The standard Socket Services interface is what permits the use of any PCMCIA card on any PC equipped with a socket/adapter.

The programming interface for PCMCIA is called Card Services. It sends the signals to link Socket Services to the PC's operating system and hardware. Card Services can be implemented either as a driver, or in the operating system, as is IBM® DOS 6.0.

Card Information Structure (CIS) contains information about how the card functions, its size, its electrical requirements, and so on. On card insertion, the card passes this identifying information to the host system.

The system software reads the CIS data on insertion, installs the appropriate drivers, notifies relevant system resources, and initializes the card to make it available for use by the host.

PCMCIA Glossary.

API (Application Program Interface)—A PCMCIA-aware device driver that is provided to higher-level software than the Card Services layer. (See *How Does PCMCIA Work?* **above**.)

ExCA (Exchangeable Card Architecture)—An extension to the PCMCIA specification, added by Intel® to ensure PCMCIA cards' interoperability on host systems using Intel CPUs.

Hot-Swapping—A hardware and software protocol defined by PCMCIA whereby PC cards can be removed and inserted into sockets without powering-down or rebooting the PC.

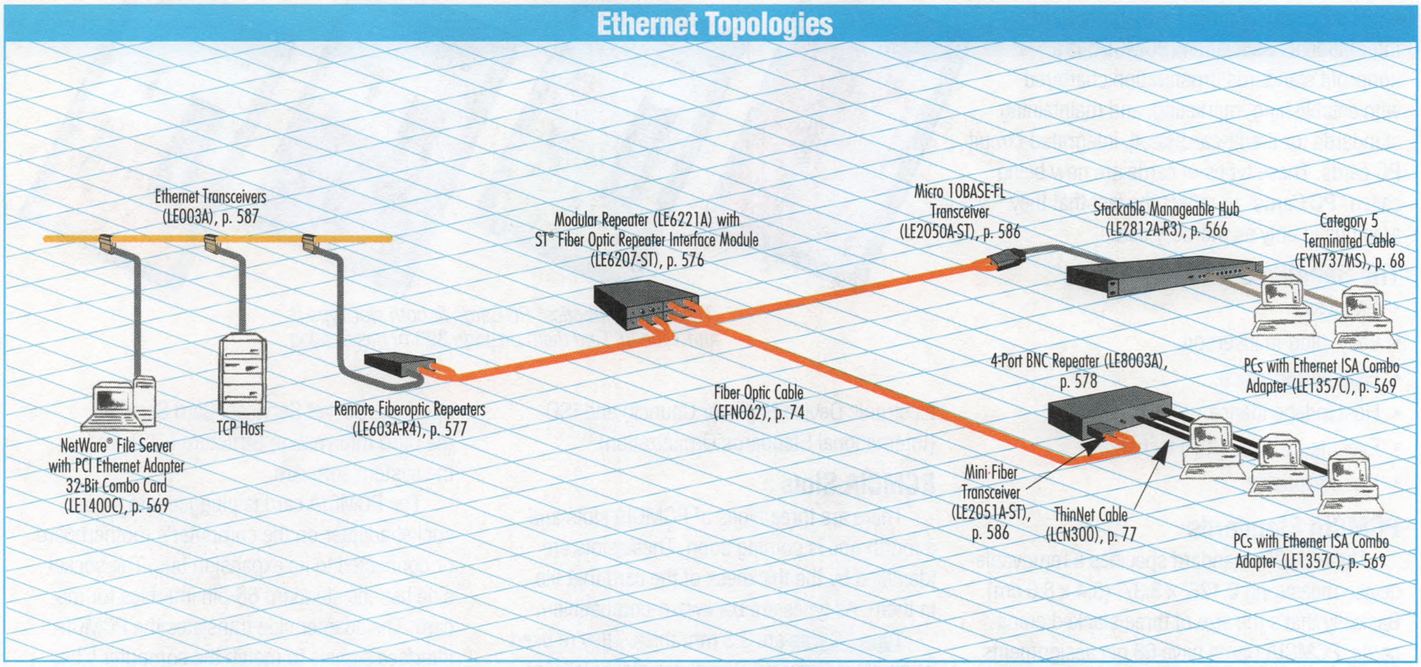
MTD (Media Technology Drivers)—MTDs provide an effective method for making upper software layers independent of card technology. In the future, almost every PCMCIA card will have MTDs associated with it. The MTDs will contain information such as programming algorithms for various devices on the card.

XIP (Execute in Place)—A technique by which software placed on a PCMCIA-compatible ROM card can be executed directly from the card itself instead of being loaded into RAM first.

PLUS!
PCMCIA Adapters, see p. 317.

Designing Your Ethernet LAN.

Ethernet Topologies


Ethernet Transceivers (LE003A), p. 587
NetWare® File Server with PCI Ethernet Adapter 32-Bit Combo Card (LE1400C), p. 569
TCP Host
Remote Fiberoptic Repeaters (LE603A-R4), p. 577
Modular Repeater (LE6221A) with ST® Fiber Optic Repeater Interface Module (LE6207-ST), p. 576
Fiber Optic Cable (EFN062), p. 74
Micro 10BASE-FL Transceiver (LE2050A-ST), p. 586
Stackable Manageable Hub (LE2812A-R3), p. 566
Category 5 Terminated Cable (EYN737MS), p. 68
PCs with Ethernet ISA Combo Adapter (LE1357C), p. 569
4-Port BNC Repeater (LE8003A), p. 578
Mini Fiber Transceiver (LE2051A-ST), p. 586
ThinNet Cable (LCN300), p. 77
PCs with Ethernet ISA Combo Adapter (LE1357C), p. 569

Key Features of Ethernet Topologies:

- **Fast, reliable throughput speed—10 Mbps.**
- **Accurate transmission—CSMA/CD access method.**
- **Easy compatibility—more LAN components match Ethernet standards than any other.**
- **Maximum flexibility—two topologies (bus or star) and five kinds of cable (Standard or Thin coax; unshielded twisted pair; FOIRL or 10BASE-FL fiberoptic).**

Overview:

Ethernet is the most widely used network topology. You can choose between bus and star topologies, and coaxial, twisted-pair, or fiberoptic cabling. And with the right connective equipment, multiple Ethernet-based LANs (local area networks) can be linked together no matter which topology and/or cabling system they use. In fact, with the right equipment and software, even Token Ring, AppleTalk®, and wireless LANs can be connected to Ethernet.

Ethernet uses **CSMA/CD** (Carrier Sense Multiple Access with Collision Detection). In this method, multiple workstations access a transmission medium (**Multiple Access**) by listening until no signals are detected (**Carrier Sense**). Then they transmit and check to see if more than one signal is present (**Collision Detection**). Each station attempts to transmit when it "believes" the network is free. If there is a collision, each station attempts to retransmit after a preset delay which is different for each workstation.

Collision detection is an essential part of the CSMA/CD access method. Each transmitting workstation needs to be able to detect that simultaneous (and therefore data-corrupting) transmission has taken place. If a collision is detected, a "jam" signal is propagated to all nodes. Each station that detects the collision will wait some period of time and then try again.

The two possible topologies for Ethernet are bus and star. The **bus** is the simplest (and the traditional) topology. Standard Ethernet (10BASE5) and Thin Ethernet (10BASE2), both based on coaxial cable systems, use the bus.

In this one-cable LAN, all workstations are connected in succession (a "bus" arrangement) on a single cable. All transmissions go to all the connected workstations. Each workstation then selects those transmissions it should receive based on the address information contained in the transmission.

In a **star** topology, all attached workstations are wired directly to a central hub that establishes, maintains, and breaks connections between them (in the event of an error). The advantage of a star topology is that it's easy to isolate a problem node. The disadvantage is that if the hub fails, the entire system is compromised.

Twisted-Pair Ethernet (10BASE-T), based on unshielded twisted pair, and Fiberoptic Ethernet (FOIRL and 10BASE-FL), based on fiberoptic cable, use the star.

Typical Applications.

Use a **bus** topology for a large network with many users and longer segments. With repeaters or media converters, you can easily interconnect to other networks with different topologies.

Use a **star** topology when you want to use twisted-pair cabling (10BASE-T Ethernet) for a multiple-building campus setup (you might already have twisted pair—telephone wire—installed on your premises).

Use a star topology for your fiberoptic links.

Technically Speaking...Choose Your Cabling System.

Standard Ethernet (Coax): 10BASE5

- The maximum length of a segment is 500 m (1640 feet).
- A maximum of 2 IRL (InterRepeater Links) is allowed between devices; the maximum length of cable is 2.5 km (1.5 miles).
- Devices attach to the backbone via transceivers.
- The minimum distance between transceivers is 2.5 m (8.2 feet).
- The maximum length of a transceiver cable is 50 m (164 feet).
- Up to 100 transceiver connections can be attached to a single segment.
- Only transceivers without SQE ("heartbeat") test enabled should be used with repeaters.
- Both ends of each segment should be terminated with a 50-ohm resistor.
- One end of each segment should be grounded to earth.

Twisted-Pair Ethernet (Unshielded Twisted Pair): 10BASE-T, UTP

- There are two versions of Ethernet over unshielded twisted pair: 10BASE-T (the standard) and its predecessor UTP.
- 10BASE-T and UTP segments can coexist on the same network via a transceiver and transceiver cable or converter when each hub is attached to a common segment.
- The cable used is 22 to 26 AWG unshielded twisted pair (standard telephone wire), at least Category 2 with two twists per foot. Category 3 or 4 is preferred. Category 5 supports 100BASE-T (Fast Ethernet).
- Workstations are connected to a central concentrator ("hub") in a star configuration. Concentrators can be attached to a fiberoptic or coax network and can be daisychained to form larger networks.
- A hub usually also has an AUI port for standard Ethernet connections.
- The maximum distance of a segment (from concentrator to node) is 100 m (328 feet).
- The maximum number of devices per segment is two. One device is the hub port; the other is the 10BASE-T or UTP device.
- Ethernet network interface cards (NICs) are available with built-in 10BASE-T transceivers.
- Devices with standard AUI ports may be attached with a twisted-pair transceiver.
- Twisted pair is the most economical cable type, especially since it may already be installed, and it is the easiest to work with. But it is not recommended for installations with much EMI/RFI interference (for example, in industrial environments).

ThinNet Ethernet (Coax): 10BASE2

- The maximum length of a segment is 185 m (607 feet).
- A maximum of 2 IRL (InterRepeater Links) is allowed between devices; the maximum length of cable is 925 m (3035 feet).
- Typically, devices use Ethernet network interface cards (NICs) with built-in BNC transceivers. This eliminates the need for separate transceivers, as connections can be made directly to the ThinNet cable.
- Devices are connected to the cable with T-connectors, which must be plugged directly into the card. No cable is allowed between the T and the card. Workstations are daisychained with an "in-and-out" cabling system.
- The minimum distance between T-connectors is 0.5 m (1.6 feet).
- If the interface card does not have its own built-in BNC transceiver, a BNC transceiver and transceiver cable are required. The maximum length of a transceiver cable is 50 m (164 feet).
- Up to 30 connections can be attached to a single segment.
- Both ends of each segment should be terminated with a 50-ohm resistor.
- One end of each segment should be grounded to earth.

Fiberoptic Ethernet: FOIRL or 10BASE-FL

- There are two versions of Ethernet over fiberoptic cable, one for the older FOIRL (Fiber Optic InterRepeater Link) and one for the more recent 10BASE-FL standards.
- FOIRL and 10BASE-FL fiberoptic Ethernet differ only in how far each will transmit (the maximum length of a segment). For FOIRL it is 1 km (0.6 miles); for 10BASE-FL it is 2 km (1.2 miles).
- The maximum number of devices per segment is two. One device is the hub port, the other device is the 10BASE-FL device.
- Fiberoptic cable provides the best signal quality as well as the greatest point-to-point distance.
- Fiberoptic cable is completely free of EMI/RFI interference.
- Fiberoptic cable runs point to point only—it cannot be tapped or daisychained. A fiberoptic hub or multiport repeater is required to carry the signal to multiple devices (for FOIRL, a FOIRL multiport repeater and transceivers).
- Since fiberoptic cable does not carry electrical charges, all electrical cable problems disappear. When fiberoptic cable (outdoor quality) is used to link buildings, grounding problems and voltage spikes are eliminated. And fiberoptic cable is immune to electronic eavesdropping.

What Are My Choices for High-Speed Networking?

Black Box Compares Today's Popular High-Speed Networking Options.

Switched Ethernet

Switched Ethernet relies on centralized multiport Switches to provide a physical link between multiple LAN segments. Inside each intelligent Switch, high-speed circuitry supports wire-speed virtual connections between all the segments for maximum bandwidth allocation on demand. Adding new segments to a Switch increases the aggregate network speed while reducing overall congestion, so Switched Ethernet provides superior configuration flexibility. It also gives you an excellent migration path from 10- to 100-Mbps Ethernet since both segments can often operate via the same Switch.

Benefits of Switched Ethernet—It's a cost-effective technique for increasing the overall network throughput and reducing congestion on a 10-Mbps network. Other than the addition of the switching hub, the Ethernet network remains the same—the same network interface cards, the same client software, the same LAN cabling.

100BASE-T (IEEE 802.3u)

100BASE-T retains the familiar CSMA/CD media access technique used in 10-Mbps Ethernet networks. It also supports a broad range of cabling options: two standards for twisted pair, one for fiber. 100BASE-TX supports 2-pair Category 5 UTP or Type 1 STP cable. 100BASE-T4 uses 4-pair Category 3 or 4 cable. And 100BASE-FX allows fiberoptic links via duplex multimode fiber cable.

Benefits of 100BASE-T—It retains CSMA/CD so existing network management systems don't need to be rewritten. It can easily be integrated into existing 10-Mbps Ethernet LANs so your previous investment is saved (see **Figure 1** on **page 631**). It's also backed by hundreds of manufacturers in the high-speed networking industry, including Black Box!

100VG (IEEE 802.12)

100VG uses an encoding scheme called Quartet Signaling to transmit data simultaneously over all four pairs in the network cable so it achieves a full tenfold increase in transmission speeds over 10BASE-T. It also replaces the CSMA/CD media access control protocol with Demand Priority to optimize network operation and eliminate the overhead of packet collisions and recovery. Demand Priority works like this: The hub directs all transmissions, acknowledging higher-priority packet requests before normal-priority requests. This effectively guarantees bandwidth to time-sensitive applications like voice, video, and multimedia applications.

Benefits of 100VG—It uses a transmission frequency very similar to traditional Ethernet, and works on any conventional cabling system (Category 3, 4, or 5 UTP, Type 1 STP, and fiber optics) and uses the same connectors. In addition, 100VG may soon support Token Ring networks—a potential advantage over its rival standard 100BASE-T.

ATM

Asynchronous Transfer Mode (ATM) is a cell-based fast-packet communication technique that supports data-transfer rates ranging from sub-T1 speeds (less than 1.544 Mbps) up to 10 Gbps.

Like other packet-switching services (Frame Relay, SMDS), ATM achieves its high speeds in part by transmitting data in fixed-size cells and dispensing with error-correction protocols. Instead, it relies on the inherent integrity of digital lines to ensure data integrity.

Benefits of ATM—Networks are extremely versatile. An ATM network can be treated as a single network, whether it connects points in a building or across the country. Its fixed-length cell-relay operation, the signaling technology of the future, offers more predictable performance than variable-length frames. And it can be integrated into an existing network as needed without having to upgrade the entire LAN.

Black Box Explains...

The Advantages of 100BASE-T.

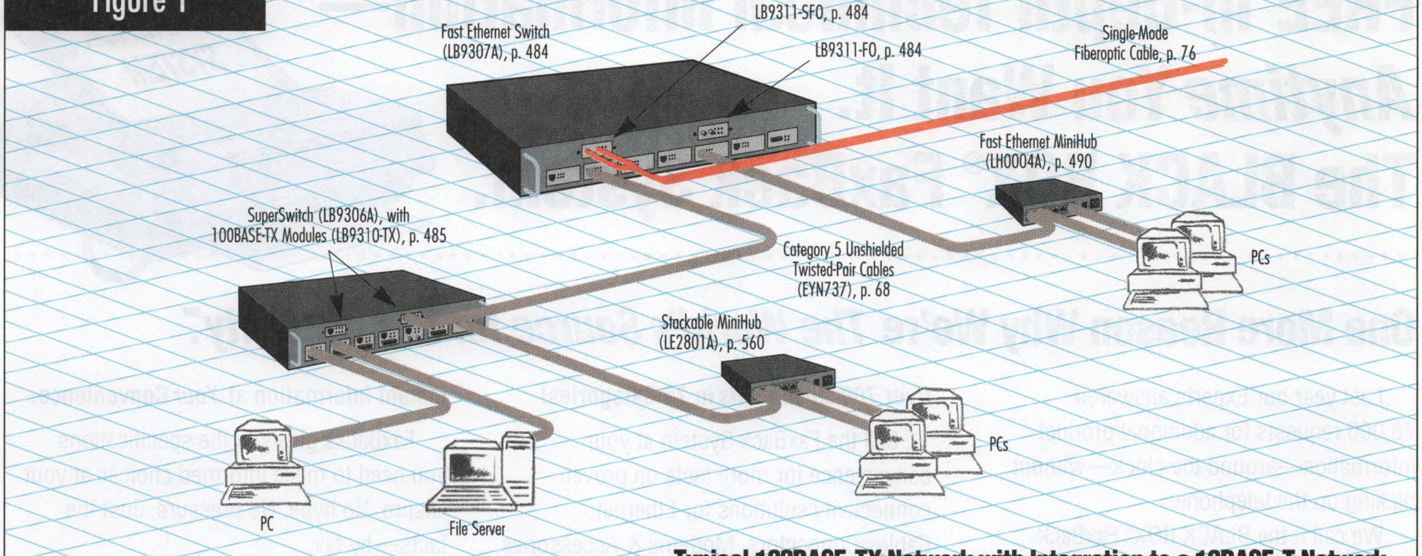
- Carries data, voice, and video at up to 100 Mbps.
- Supports CSMA/CD protocol so you can use your existing networking software.
- Operates over inexpensive Unshielded Twisted-Pair (UTP) cabling.
- Can be implemented gradually as 10/100-Mbps adapters and hubs where 10- or 100-Mbps bandwidth is software-selectable.
- Serves as a stepping stone to even faster technologies like ATM.

FOR COMPARISON: 100-MBPS ETHERNET STANDARDS

	100BASE-T (IEEE 802.3u)	100VG (IEEE 802.12)
Variations of This Standard	100BASE-TX 100BASE-T4 100BASE-FX	IEEE 802.3 Ethernet Framing IEEE 802.5 Token Ring Framing (pending)
Supported Cable Type	**100BASE-TX:** Category 5 (2-Pair) IBM® Type 1 (2-Pair) **100BASE-T4:** Category 3 or 4 (4-Pair) **100BASE-FX:** Duplex Multimode or Single-Mode Fiber	Category 3, 4, or 5 (4-Pair) Duplex Multimode Fiber
Maximum Cable Segments	(Hub-to-Node) **100BASE-TX or T4:** Category 3, 4, or 5—100 m IBM Type 1—100 m **100BASE-FX:** Multimode Fiber—2 km, Single-Mode—10 km	Category 3, 4, or 5 (4-Pair) 100 m Multimode Fiber—2 km
Best Applications	Backbone using Ethernet switches to provide increased throughput. Small to medium workgroups using applications (i.e.: CAD, CAM) which output huge data files.	Networks using extremely time-sensitive data such as videoconferencing or multimedia.

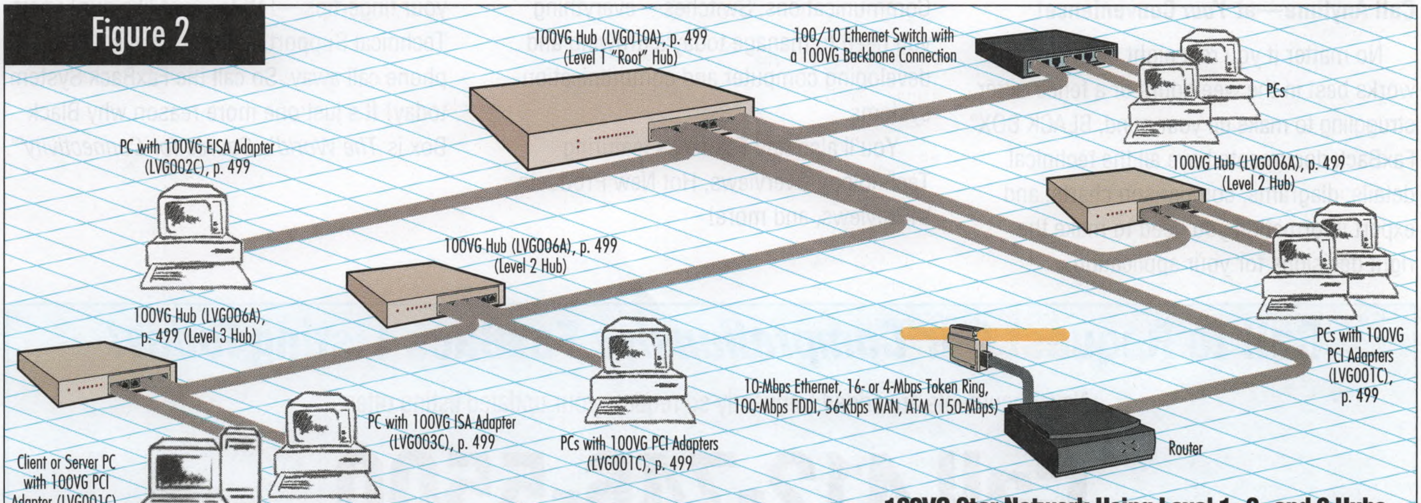
In This Section...
Glossary
Hexadecimal Chart
Serial Data Transmission
Modem Standards

Figure 1


Fast Ethernet Switch
(LB9307A), p. 484
LB9311-SFO, p. 484
LB9311-FO, p. 484
Single-Mode
Fiberoptic Cable, p. 76
Fast Ethernet MiniHub
(LH0004A), p. 490
PCs
SuperSwitch (LB9306A), with
100BASE-TX Modules (LB9310-TX), p. 485
Category 5 Unshielded
Twisted-Pair Cables
(EYN737), p. 68
Stackable MiniHub
(LE2801A), p. 560
PCs
PC
File Server

Typical 100BASE-TX Network with Integration to a 10BASE-T Network.

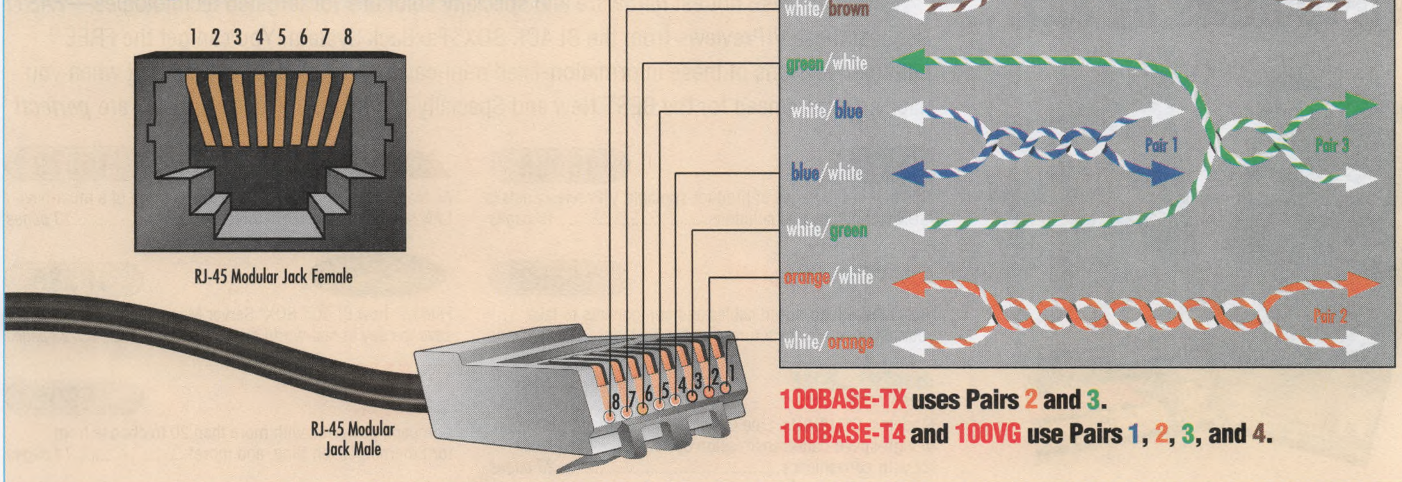
Figure 2


100VG Hub (LVG010A), p. 499
(Level 1 "Root" Hub)
100/10 Ethernet Switch with
a 100VG Backbone Connection
PCs
PC with 100VG EISA Adapter
(LVG002C), p. 499
100VG Hub (LVG006A), p. 499
(Level 2 Hub)
100VG Hub (LVG006A), p. 499
(Level 2 Hub)
100VG Hub (LVG006A),
p. 499 (Level 3 Hub)
PCs with 100VG
PCI Adapters
(LVG001C),
p. 499
10-Mbps Ethernet, 16- or 4-Mbps Token Ring,
100-Mbps FDDI, 56-Kbps WAN, ATM (150-Mbps)
Router
PC with 100VG ISA Adapter
(LVG003C), p. 499
PCs with 100VG PCI Adapters
(LVG001C), p. 499
Client or Server PC
with 100VG PCI
Adapter (LVG001C),
p. 499

100VG Star Network Using Level 1, 2, and 3 Hubs.

Black Box Explains...

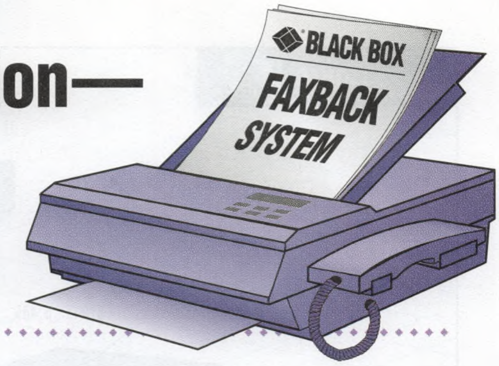
Pinning Specifications for High-Speed Networking with Twisted-Pair Cable.


1 2 3 4 5 6 7 8
RJ-45 Modular Jack Female
RJ-45 Modular
Jack Male
8 7 6 5 4 3 2 1
brown/white
white/brown
green/white
white/blue
blue/white
white/green
orange/white
white/orange
Pair 4
Pair 1
Pair 3
Pair 2

100BASE-TX uses Pairs 2 and 3.

100BASE-T4 and 100VG use Pairs 1, 2, 3, and 4.

FREE In-Depth Technical Information—*Anytime* You Want It. The BLACK BOX® FaxBack System.



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VIPreview

VIPreview	Document	Description	Pages
ISDN	15066	This first in our series of product-spotlight VIPreviews details ISDN technology and solutions.	16 pages
high-speed	16579	As technology advances, 100-Mbps is more of a must-have LAN solution than ever before.	13 pages
CAT5 Updated!	16562	Install these high-speed cables and components to take your network into the future. Newly updated!	21 pages
Server Management	16586	Find out how BLACK BOX® Server Management solutions save the day in real-world applications.	23 pages
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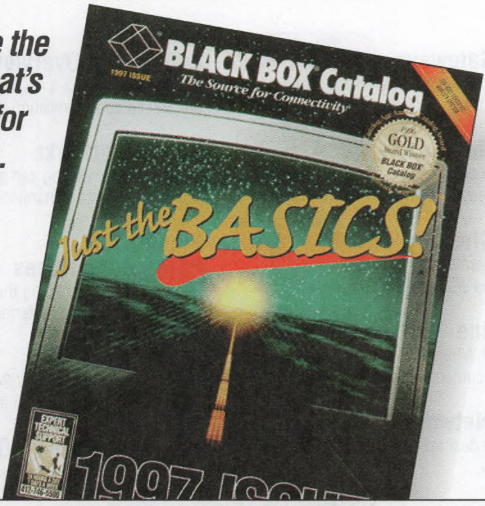
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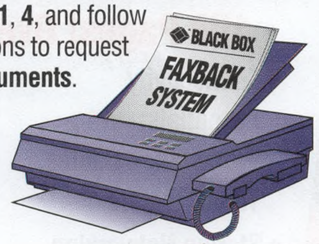
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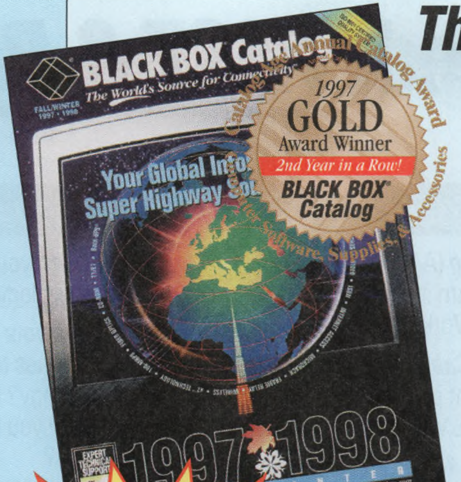
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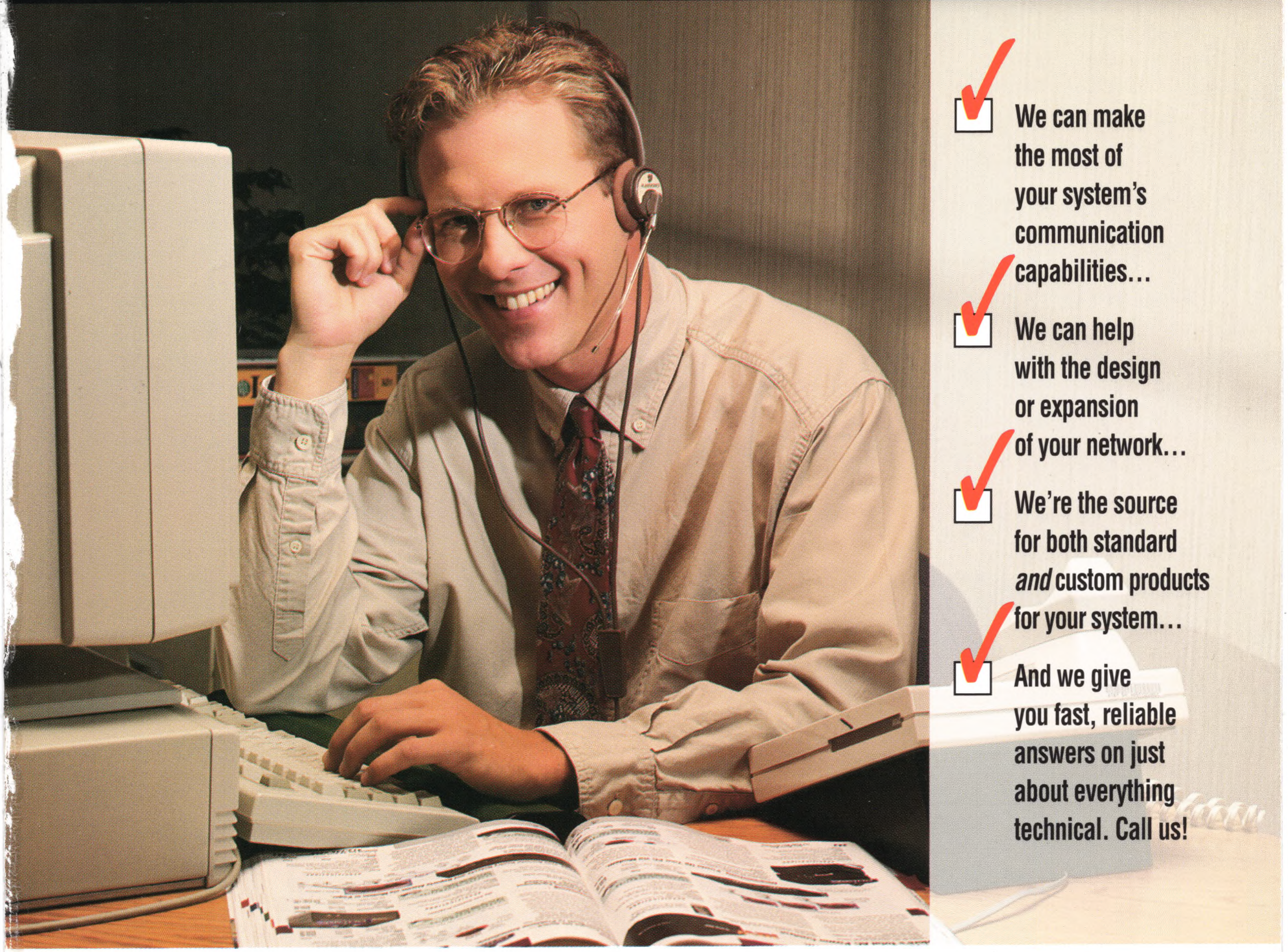

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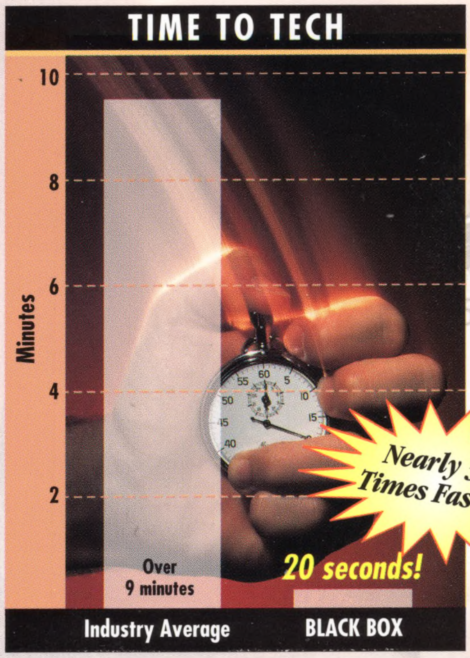

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